DOMINION BRIDGE CO.
LIMITED

WE BUILD

BRIDGES

of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

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MONTREAL, QUE.
Works at Lachine Locks, P.Q.

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WALKERVILLE, ONTARIO

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Steel Buildings
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Locomotive Turn Tables and Structural Steel and Iron Work of all descriptions.
Estimates furnished on application.

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Cold Drawn Crimped Wire Bonding
for
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Some of the features of our BONDING consists in its
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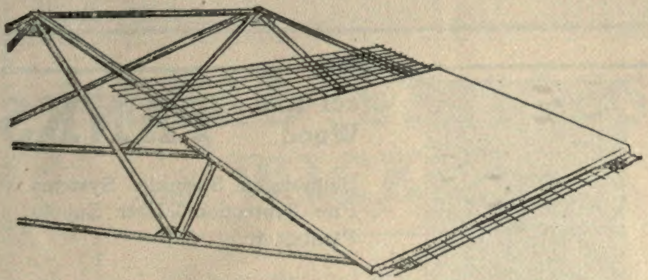

We can supply in continuous lengths or in sheets cut to size.

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Canada Wire Goods Mfg. Co.
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We specialize in Prison Metal Works, Gratings, Grilles and Wire Work of every description.

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Complete Combustion
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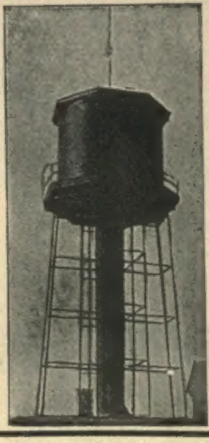

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Ontario Wind Engine & Pump Co.
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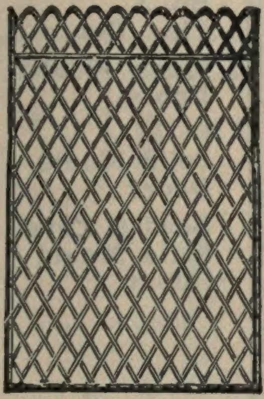

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Store and Basement Windows
and for all Public Buildings.

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"Galt" Expanded Steel Lath

holds plaster in any position as long as a building stands.

The rough "tenacious" meshes of "Galt" Lath are *embedded* in the plaster—not stuck to it.

"Galt" Lath can't crack or stain the plaster because it does not shrink, warp or dry out like wooden lath.

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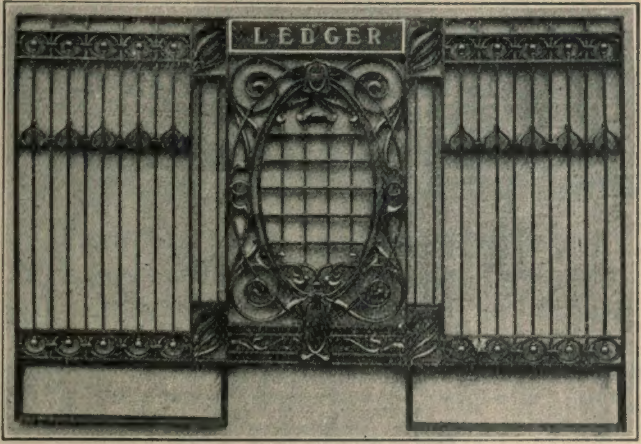
The **Galt Art Metal Co., Ltd.**
Galt, Ontario

Winnipeg — **T. R. Billett**
Toronto — **W. D. Beath & Son**



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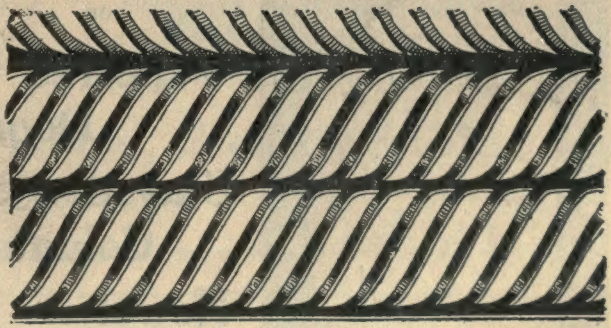

It allows a greater variety of finish at a lower cost than any other construction. It gets stronger with age. It is vermin proof, weather proof and fire proof.

It solves the housing problem in overcrowded towns and cities, because it is quickly erected and is cheaper than wood.

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The lowest-priced flooring obtainable may in the end prove most expensive.

The contractor who aims to give satisfaction is invited to consider the merits of

"Empire" Brand Hardwood Flooring

It gives the finishing touches of perfection, something inferior floorings cannot do.

People whose contracts are most desirable are anxious to have their homes built by a particular contractor. Particular contractors should use **"Empire" Brand Flooring.**

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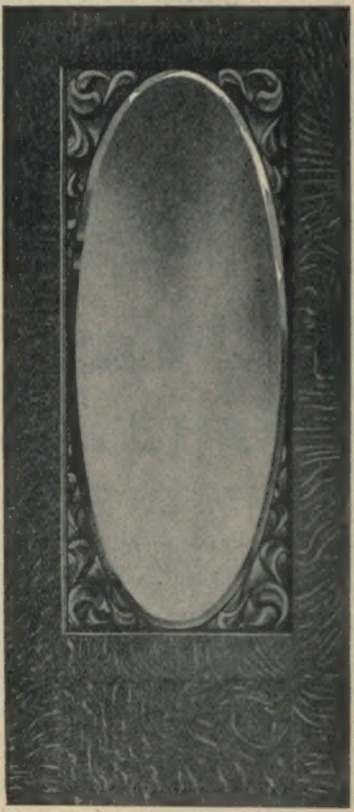

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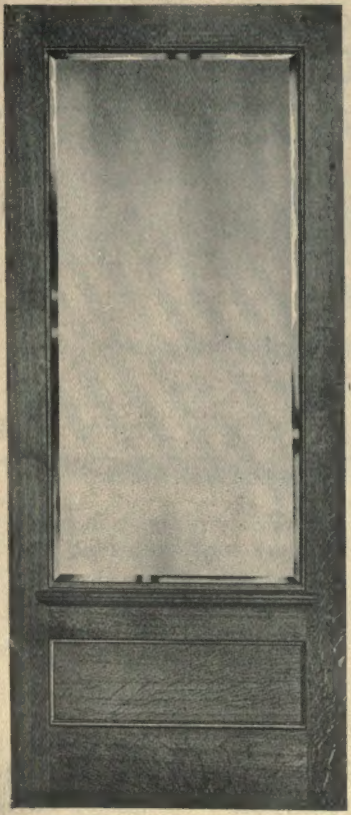

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Price of 2—10 x 6—10	$6.00	$6.50
Price of 3— 0 x 7— 0	6.25	6.75

These doors are stocked in the above sizes only and are 1¾ in. thick.

Our modern facilities and careful attention to details, enable us to give close prices on

Veneered Doors
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Price quoted are F. O. B. West Toronto. If required to be crated add 15 cents per door.

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Hardwood Flooring

of a high grade is assured if you will order stock bearing the stamp "Wilson Bros. Limited."

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Hardwood Flooring

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That can be Produced Anywhere

DIAMOND BRAND
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HARDWOOD FLOORING

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All our flooring is smoothed NOT SCRAPED. Tongue and groove hollow backed, bored and bundled.

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We are practical block makers and claim to have the only machine in Canada suited to the building trade.

The Maple Leaf Block Machine

makes all sizes of blocks. Quickly adjusted, easily operated Very simple in construction. In fact it is a whole lot of machines in one.

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A full line of Concrete Machinery on hand.

Maple Leaf Concrete Machinery Works
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Ideal Concrete Mixer

Most Up-to-date Batch Mixer on the Market

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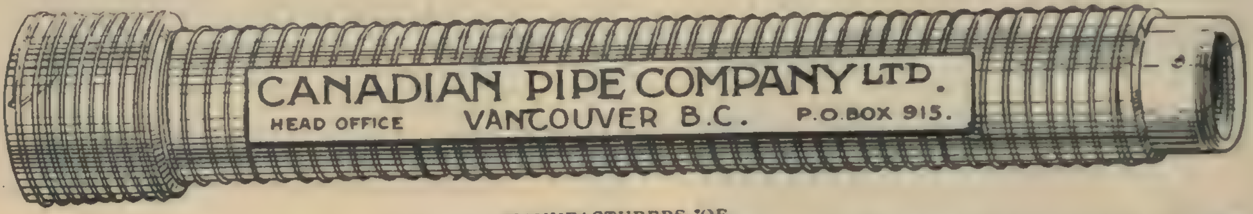
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The "L & K" Test Boring and Light Well Sinking Machine

Operating in Kingston Harbor

When you estimate a foundation for construction
do you know how far to go to reach a solid formation?
If not send for catalog.

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Engineers and Machinists **London, Canada**

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It is furnished with bronze stem, disc rings and seat rings, is of substantial design and weight and is tested thoroughly before shipment is made.

We will send catalogue of valves and hydrants upon request.

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The Kerr Engine Company
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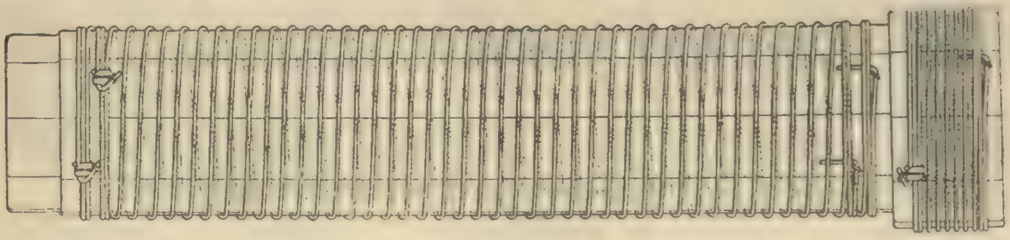
WALKERVILLE, Ontario



End View of Pipe and Coupling.

The Dominion Wire Wound Wood Water Pipe

Showing special method of winding with two independent parallel wires. The great advantage of this is that in event of one wire becoming damaged the pipe still retains a factor of safety of 2.5. Made only by

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Also Manufacturers of Continuous Stave Pipe for Irrigation and Power Purposes. Write for Catalogue.

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THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
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3 inches to 60 inches diameter
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GAS ENGINE

Action like a steam engine. Sizes 200 B. H. P. upwards to 4,000 B. H. P. Specially suitable for driving alternators in parallel. Over 150,000 B. H. P. running or in course of construction. Catalogue?

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STEAM TURBINE

Safe Installation. Easy Examination. Continuous and economical Operation. Send us your enquiries.

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Messrs. Mather & Platt Limited
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CANADIAN AGENTS
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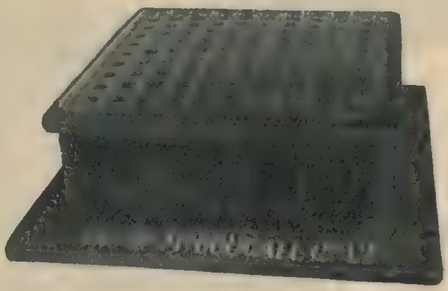
Manhole Covers *and* Frames



We have several designs and this shows the article in most general use. It is Heavy and Substantial, made from good materials and will stand any strain to which it may be subjected. Will be pleased to furnish particulars of these, together with

Catch Basins, Hydrants
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Valves
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General Water
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SMALL DIAMETER WHEELS AND CASTINGS FOR CONTRACTORS. CAR WHEELS. CASTINGS OF ALL KINDS

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Manufacturers of the Well-known

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in Sizes from 8 to 60 H. P.

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A Road Grader for $75.00

The Humane Tongueless Road Grader and Leveller

will be sent f. o. b. to any station in Ontario for the above price. This grader will do anything that can be done with a heavy grader, and has many advantages besides. Write for circular.

This grader was recently tested on snow in Hamilton and did its work satisfactorily. Can be worked with either wheels or runners.

Climax Road Machine Co.
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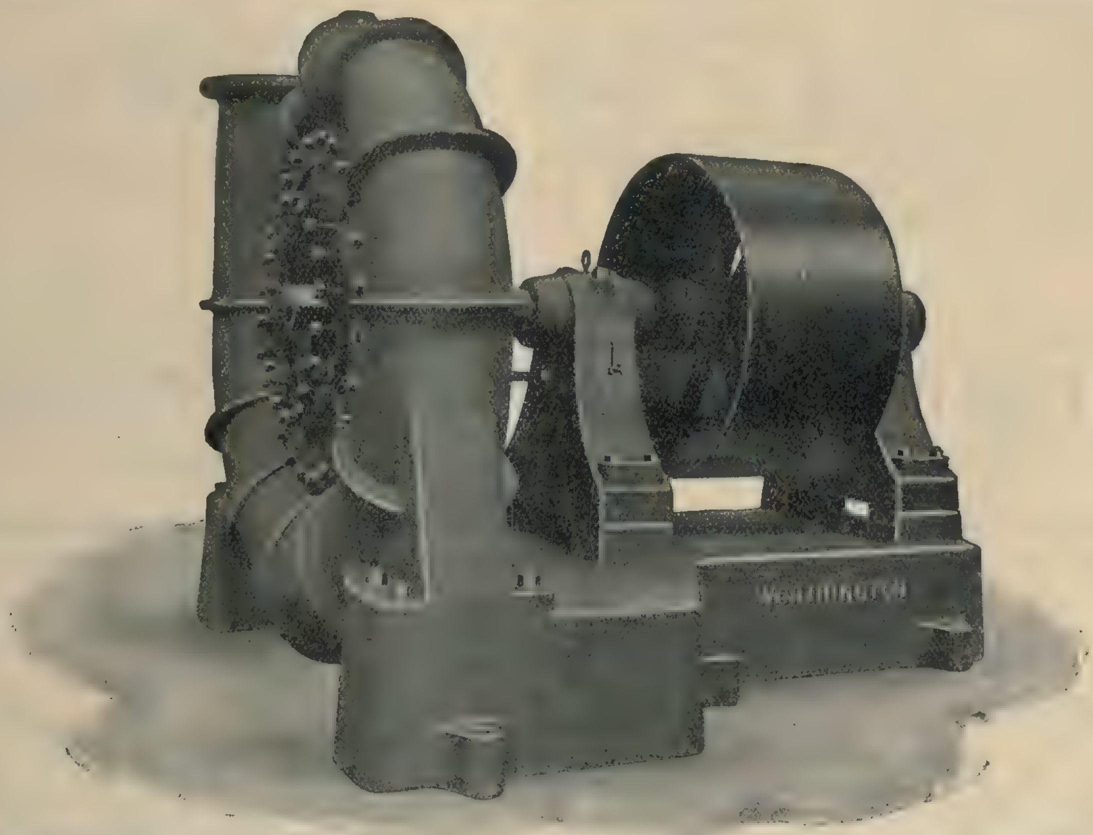
OF ALL CAPACITIES AND FOR HEADS UP TO 1,500 FEET

SIMPLE - NOISELESS - COMPACT



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20-INCH VOLUTE CENTRIFUGAL PUMP, CAPACITY 11,000 GALS. PER MINUTE FOR HANDLING WOOD PULP AT THE LAURENTIDE PAPER CO., GRANDMERE, QUEBEC.

FOR COFFER DAM AND EXCAVATING WORK AND FOR DREDGING THESE PUMPS ARE SPECIALLY DESIGNED TO WITHSTAND THE ABRADING ACTION OF STONES AND GRAVEL.

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Works: Montreal. Sales Offices: New Glasgow, Montreal, Toronto, Cobalt, Winnipeg, Calgary, Vancouver.

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¶ Having kilns on both C.P.R. and G.T.R., we can offer you every shipping facility.

¶ Our central office in Toronto with long distance phone main 5377 can look after your orders **at once** as it is in daily communication with all branches.

¶ Both our White and Grey Lime are particularly strong setting. We know it, but don't take our say so. Try them in your own proportions with materials regularly used, and be convinced.

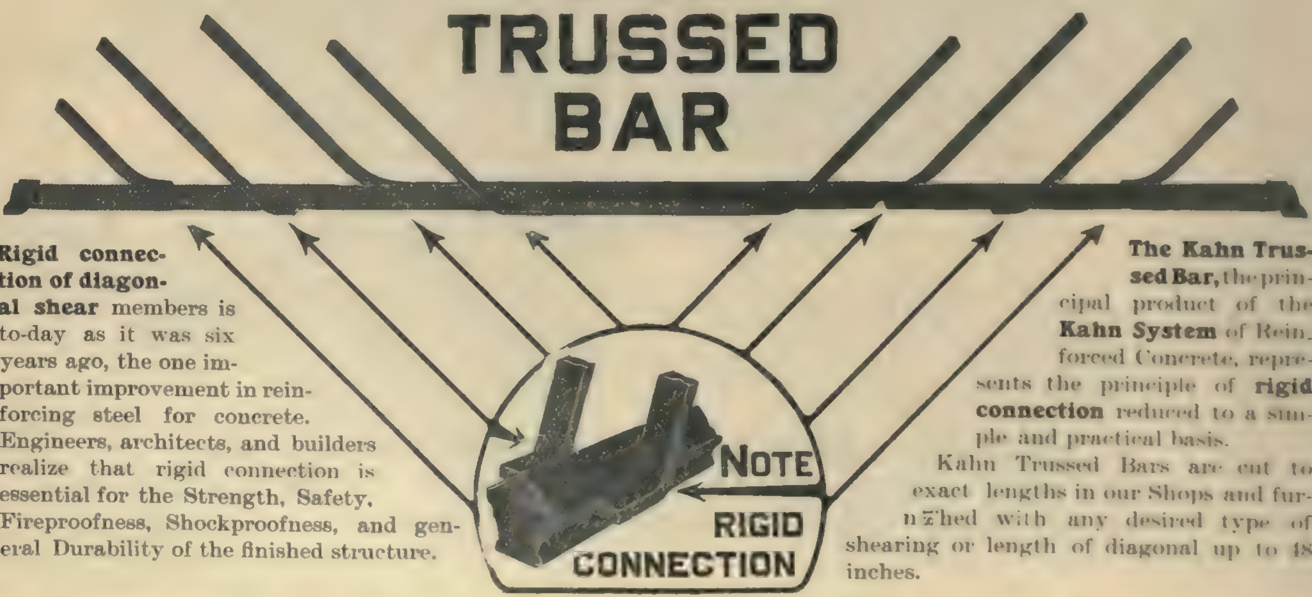
¶ We also handle Crushed and Building Stone for all purposes.

¶ Phone Toronto Main 5377 or write.

Christie, Henderson & Co., Limited

Head Office: **34 Yonge Street, Toronto**

KAHN TRUSSED BAR



Rigid connection of diagonal shear members is to-day as it was six years ago, the one important improvement in reinforcing steel for concrete. Engineers, architects, and builders realize that rigid connection is essential for the Strength, Safety, Fireproofness, Shockproofness, and general Durability of the finished structure.

The Kahn Trussed Bar, the principal product of the **Kahn System** of Reinforced Concrete, represents the principle of **rigid connection** reduced to a simple and practical basis.

Kahn Trussed Bars are cut to exact lengths in our Shops and furnished with any desired type of shearing or length of diagonal up to 48 inches.

Structures of every type, of every size, have been built Kahn System— Factories, Warehouses, Power Plants, Hotels, Apartment Houses, Office Buildings, Public Buildings, Bridges, Viaducts, Reservoirs, Tunnels, etc. We publish separate catalogues describing them.

Also catalogues giving properties of the various Kahn System Products, Kahn Trussed Bars, Hy-Rib Sheathing, Rib Lath, Rib Metal, Cup Bars and "Kahn System Standards," the best Handbook on Reinforced Concrete Design. Our complete experience and large organization is at your service. Write to-day stating your requirements.

TRUSSED CONCRETE STEEL CO. of Canada, Limited

WALKERVILLE Offices in all Principal Cities TORONTO

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Almonte, Ont.
The by-law to raise $15,000 for street improvement was carried.

Fort Erie, Ont.
J. FitzGibbon, W. E. Hunt, Geo. Dean, J. J. Foster and Rev. A. C. MacIntosh are a special committee appointed to ascertain the cost of installing a municipal water works system.

Galt, Ont.
The Good Roads by-law to raise $10,000 was defeated.

Kingston, Ont.
The ratepayers defeated the by-law to expend $25,000 on street improvements.

The City Engineer has submitted a report showing the cost of road paving on sections of the following streets, viz.: Princess street, $8,658.60; Wellington street, $8,779.80; Clarence street, $10,109.40; Brock street, $4,900.80; King street, $9,501; Ontario street, $13,066.80.

London, Ont.
The by-law for the extension of the waterworks system was defeated by the ratepayers.

Meaford, Ont.
The by-law to provide for the cost of a new filtering basin for the waterworks has been carried.

Montreal, Que.
Alderman Lariviere, Chairman of the Roads Committee, states that no time will be lost in calling for tenders for paving, curbstone and sidewalk material. It is hoped to have tenders ready for consideration about January 20th. The borrowing power is $2,500,000. A large portion of this will be expended upon public works.

North Toronto, Ont.
The following local improvement works will be constructed: Six-inch water main, hydrants, valves, etc., on Bowood avenue; tar and gravel sidewalk, 4 ft in width, with necessary grading, on Broadway. Wm. J. Douglas is Town Clerk.

New Toronto, Ont.
A. F. Macallum and T. Aird Murray, consulting engineers, Toronto, are jointly engaged in the preparation of plans for the installation of the proposed sewerage system in this township.

Oakville, Ont.
The time for receiving tenders for intake pipe for the waterworks has been extended to 8 p. m., on Wednesday, January 6th. Contractors are to furnish materials and labor. Plans may be seen at Oakville or at the office of Willis Chapman, 103 Bay street, Toronto. A. S. Chisholm is Chairman, Board of Water Commissioners.

Port Elgin, Ont.
The ratepayers defeated the by-law to raise $3,000 for the extension of the waterworks.

Renfrew, Ont.
The ratepayers have approved a by-law to expend $5,000 upon sewer extension.

St. Thomas, Ont.
The ratepayers have approved a by-law to raise $40,000 for septic tanks for city sewage.

Stratford, Ont.
The ratepayers carried the by-law to raise $25,000 for the extension of the sewage disposal works.

Construction will shortly commence on a new sewer along William street, across James street and Walnut avenue, and up to Idington avenue.

Waterloo, Ont.
The ratepayers have voted in favor of expending $5,000 for road improvement.

Winnipeg, Man.
Tenders addressed to the Chairman of the Board of Control will be received until January 11th for the following supply of cast iron water pipe: 2,500 feet 18-in; 8,000 feet 8-inch, and 5,000 feet 10-inch, delivered f.o.b. city yards. Specifications may be obtained at the office of H. N. Ruttan, City Engineer.

Notice is given that plans have been approved of certain drains in townships 36, 37 and 38, ranges 25, 26 and 27 west, at an estimated cost of $48,000, and that the work will be carried out as a local improvement by the Provincial Department of Public Works.

AWARDED.

Markdale, Ont.
Tenders for a portion of the waterworks system were opened on December 28th by the Town Council with the following results: For furnishing pipe and accessories including hydrants, valves, specials, etc.:—For cast iron pipe: Gartshore-Thompson, $33 per ton for straight and $60 per ton for specials; Canadian Iron & Foundry Company, $35 and $60 respectively, and Canada Foundry Company, $33.75 and $58. The Canadian Fairbanks Company tendered an itemized bid for hydrants and valves. The contract was let to the Canada Foundry Company at a price approximating $7,700, which included all piping, hydrants, valves and specials. For pipe laying, being for about 2,600 lineal feet of 8-inch, 3,200 feet of 6-inch, and 10,100 feet of 4-inch and under, laid 5 feet below the surface, 20 hydrants, 40 valves, etc., tenders were submitted as follows: Paul Bergmann, Waterloo, $4,800; Bishop & Buchanan, Owen Sound, $5,100; John F. Connolly, Toronto, $3,250; Thos. M. Cullon, Huntsville, $3,401; Robt. Foster, Welland, $3,850; John Hartnett, Toronto, $3,067; McKnight Construction Company, Toronto, $3,439; J. E. Murphy, Toronto, $4,837; Rowan & Elliott, St. Catharines, $4,400. The contract was awarded to John Hartnett. For stand pipe, steel 14 feet by 70 feet, resting on a concrete foundation about 23 feet diameter and 5 feet 6 inches deep (included): Herbert J. Armstrong, Markdale, $3,390; Canada Foundry Company, Toronto, $3,790; Jenckes Machine Company, St. Catharines, $3.625; Jenks Dresser Company, Sarnia, $2,985; Toronto Iron Works Company, Toronto, $3,200; Western Bridge Company, Chatham, $3,900. No contract was awarded as elevated tank was selected. For elevated tank, steel tank, 20 feet diameter by 28 feet high, (hemispherical bottom) supported on steel tower 60 feet high, including concrete piers: Herbert J. Armstrong, Markdale, $3,370; Canada Foundry Company, Toronto, $4,615; Jenks Dresser Company, Sarnia, $3,500; Ontario Wind Engine Company, Toronto, $4,125; Toronto Iron Works, Toronto, $3,100. The contract was awarded to the Toronto Iron Works. This work will be proceeded with in the spring and is to be completed early in the summer. Mr. C. H. Mitchell is engineer.

Victoria, B. C.
The contract for the salt water high pressure pumps has been awarded to the D'Olier Engineering Company, at $17,630, for the following equipment: Electric driven unit consisting of general electric motor, direct connected to two 2-staged D'Olier turbine pumps provided with bronze runners and diffusion veins, and one steam driven unit consisting of a Kerr steam turbine, direct connected to one D'Olier three-staged turbine pump. The following firms also tendered: Hutchinson Bros. & Company. Bithet & Company, Victoria Machinery Depot Company, Canadian General Electric Company and Watson, Stillman & Company.

Windsor, Ont.
Waterworks debentures amounting to $15,000 have been awarded to Ames & Company, Toronto.

Westmount, Que.
The Corporation has just purchased another Austin road machine. These machines are especially adapted to snow ploughing as well as road grading.

Railroads, Bridges and Wharves.

Brockville, Ont.
The C. P. R. intend to do considerable building in the spring. The intention is to build a roundhouse and turn-table and close up the present shop in the yards northwest of the fair grounds.

Charlottetown, P. E. I.
Tenders for the construction of a freight shed on the wharf at this place will be received until January 14th by D. Pottinger, General Manager, Prince Edward Island Railway. Plans and specifications may be obtained at the office of the chief engineer at Moncton, N. B., or at the superintendent's office in this town.

Cochrane, nt.
The National Transcontinental Railway are about to put in a large storage yard at Cochrane, the junction with the Temiskaming and Northern Ontario Railway. It will be in readiness, it is expected, some

time next month. There will be a capacity for thirty or forty thousand tons of rails and fastenings.

Foxwarren, Man.
A deputation from this town, consisting of Reeve Graham and others, recently waited upon the Premier at Winnipeg to urge the necessity of constructing another railway through this municipality.

Greenwich, N. B.
Tenders for rebuilding Brown's Flats high water wharf closed January 4th with John Morrissy, Chief Commissioner, Department of Public Works, Fredericton, N. B.

Kingston, Ont.
The Boards of Trade of this city and St. Catharines are approaching the Department of Railways and Canals with a view to having the Welland Canal enlarged and deepened and the St. Lawrence route improved.

Peterboro, Ont.
City Engineer Hay has submitted to the city council plans for 3-arched span of 100 feet each for the Smith street bridge. Estimated cost for 18 feet roadway and two walks, $37,500; 24-foot roadway and two walks, $46,500.

Perth, Ont.
Tenders will be received until January 9th for cedar covering to be delivered at Ferguson Falls bridge during the present winter. The covering must be sound cedar seventeen feet long and five inches thick, flatted on four sides. The amount of timber required must be enough to cover a bridge 300 feet in length.

Port Elgin, Ont.
Tenders addressed to P. A. Malcolmson, County Clerk, Walkerton, Ont., will be received until January 25th, for the erection of a steel bridge about 300 feet long over the Saugeen river, at a point about two and a half miles east of this town. Cement pier and centre to be built; the abutments are now erected. Tenderers may submit their own plans and specifications or figure on plans which may be seen at the office of the County Clerk at Walkerton.

Port Arthur, Ont.
Mayor Carrick and F. H. Keefer, in company with Messrs. MacKenzie and Mann, visited Winnipeg recently in connection with the new hotel and dock to be built in this city by the C. N. R. It is understood that the final agreement has now been reached and that the work will go right ahead.

D. D. Mann, Vice-President of the Canadian Northern Railway Company, states that the construction of a road from this city to Sudbury is the company's next project. Application for government aid will be made at the next session of parliament.

It is stated on the authority of General Manager McLeod, of the Canadian Northern, that the company will make large additions to the terminal facilities here. Some are definitely arranged and others are in contemplation. To increase the freight storage capacity at the docks a shed is now being built over the steel dock. A new dock is to be built just south of the present dock, and on it work will be started as soon as feasible. It will be used as a steel dock during the early summer and for freight when the fall rush commences. New tracks will be laid through the yards, including lines to the new elevator to be built by Piper & McWilliams.

Red Deer, Alta.
A movement is on foot to secure the construction of the Alberta Central Railway.

Stratford, Ont.
A new concrete railroad bridge will probably be constructed this year on the Owen Sound line near the waterworks. Plans have already been prepared.

Saskatoon, Sask.
This city and the C. N. R. will build a foot-bridge over the tracks at 20th street.

Sussex, N. B.
Tenders for rebuilding the McFarlane bridge over Ward's Creek closed January 4th with John Morrissy, Chief Commissioner, Department of Public Works, Fredericton, N. B.

Strathcona, Alta.
The City Council have instructed City Engineer McLean to prepare plans for a high level bridge over Mill Creek.

St. John, N. B.
Hon. Dr. Pugsley, Minister of Public Works, has asked the city to transfer certain property on the harbor to the government. If this is done, he will recommend that the government commence dredging at once for the construction of a large system of docks.

Toronto, Ont.
The ratepayers have carried a bylaw to provide $250,000 for the construction of the Wilton avenue bridge.

Vancouver, B. C.
E. A. Howard, of Chicago, Purchasing Agent for an American Transcontinental line, is reported to have secured large blocks of property on the waterfront for new terminals.

A new wharf will be erected on Westminster avenue by the Palmer Land Company at an estimated cost of $12,000.

The City Council are being urged to commence the construction of the Cambie street bridge over False Creek, for which $250,000 was voted a year ago.

Incorporation is being sought by a concern that has been organized to construct a railway from a point in or near this city to the north arm of Burrard inlet with power to extend northerly to Pemberton Meadows and to build a branch line to the shore of Howe sound.

At the next session of the legislature application will be made for a charter to build a railway on Graham island, with authority to construct various branches not exceeding fifty miles in length.

Public Buildings, Churches, Schools, etc.

Amherst, N. S.
B. C. Munroe will enter upon the construction of his new opera house early in the spring.

Brantford, Ont.
The by-laws to raise $100,000 for a new collegiate institute and $5,000 for a nurses' home at the hospital were defeated.

Berlin, Ont.
At a meeting of the Public School Board plans prepared by Chas. Knechtel for the proposed addition to the Margaret avenue school, were submitted. Estimated cost, $6,700. This addition will be built during the coming season.

The two wings of St. Jerome's College, which were recently destroyed by fire, will be rebuilt in the spring. The new structures will be four storeys in height, and will be built on the same plan as the present new building.

Chatham, Ont.
Harry J. Rill, architect, of Detroit, has prepared plans for the erection of an auditorium building in this place, for the Ursuline Sisters. The building will be two storeys in height.

Calgary, Alta.
Plans for the new central fire hall have been completed. The proposed building will be erected on the site of the present Central fire hall. Estimated cost, $42,000.

Cranbrook, B. C.
A bylaw to raise $50,000 for the erection of a new school house will not be submitted on Jan 14th as was planned, the Council having decided to obtain additional information in regard to the proposed building.

Elora, Ont.
The ratepayers have approved of a bylaw providing for the maintenance of a free library.

Edmonton, Alta.
E. R. Sims, manager of the Calgary Amusement Company, will probably erect a new theatre building here on First avenue in the near future.

Plans have been prepared for a two storey solid brick theatre building, to be erected at Edmonton by the Western Co operative Corporation, Limited. The building will be 90 by 80 feet, and will probably be erected on First street, near the King Edward hotel. Construction will probably be commenced in the spring.

Mr. Samuel Nankin, proprietor of the Grand Theatre, is having plans prepared for a new theatre building, to be erected on First street.

Guelph, Ont.
W. E. Buckingham has inaugurated a movement to raise $55,000 for the erection of a Y. M. C. A. building.

Hull, Que.
It is stated that a movement is under way for the erection of a hospital in this city.

Harriston, Ont.
The Public Library Board are asking tenders for furnishing their new library building. Particulars from W. E. Binning, architect, Listowel, Ont.

London, Ont.
The Talbot street Baptists are contemplating either the enlargement of their present building or the erection of a new church. Rev. A. J. Vining may be addressed.

Mount Forest, Ont.
The by-law to establish a free library was carried.

Montreal, Que.
The Royal Montreal Golf Club are contemplating extensive improvements to their building, including a complete system of waterworks, new quarters for servants, dressing rooms and lockers.

Chas. Bernier, architect, has prepared plans for the erection of a school for the Catholic School Commissioners. Estimated cost, $60,000.

Tenders addressed to Lieutenant-Colonel A. E. Labelle, care of Ogilvie Flour Mills Company, will be received until January 9th for the construction of an armoury for the 65th Regiment, C. M. R. Plans and specifications at office of R. A. Brassard, architect, 9 St. James street.

Moncton, N. B.

R. A. Frechet, architect, has prepared plans for the erection of a theatre of stone, wood and metal construction for Messrs. Torrie & Winter. Estimated cost $8,000.

Niagara Falls, Ont.

The ratepayers have carried by-laws to raise $3,000 for an armoury site, $8,000 for the improvement of the firehalls and $2,000 for a site for a Carnegie library.

New Westminster, B. C.

A new Y. M. C. A. building will probably be erected in this city during the coming season.

It is expected that an early start will be made this year upon the proposed new Royal Columbian Hospital, for which architect Sait is now preparing plans.

North Vancouver, B. C.

A meeting of the promoters of the proposed English church in Lynn valley was held recently when the report of the building committee as to the acquisition of the site was confirmed. Rev. J. H. Hooper, rector of St. Johns church, North Vancouver, is interested.

Outlook, Sask.

The C. P. R. have donated a site for a school building and grounds.

Omagh, Ont.

Tenders closed recently for the demolition and rebuilding of the Presbyterian church.

Oshawa, Ont.

The ratepayers have approved a by-law to erect a high school at a cost of $20,000.

Ottawa, Ont.

At a meeting of the ratepayers of Westboro, Ottawa West and Woodroffe, held last week, for the purpose of discussing additional school accommodation, a committee consisting of F. H. Honeywell, F. A. Heney, Herbert Love and W. Lawrie, were appointed to secure plans and specifications for a new building.

Sudbury, Ont.

It is proposed to build a new Presbyterian church with a seating capacity of seven or eight hundred, Address Rev. Logie.

St. Come, Que.

Plans have been prepared for a $15,000 convent to be erected at this place for the Rev. Elie du Breton. Ouellett & Levesque, Quebec, architects.

Strathroy, Ont.

The ratepayers have approved a by-law to provide for the maintenance of a Carnegie library.

Toronto, Ont.

Tenders will be called immediately for the erection of a three storey building corner of Adelaide and Bathurst streets for the St. Mary's Club. Estimated cost, $15,000. Architect, J. M. Cowan, 65 Adelaide east.

It is proposed to erect a new branch building for the West End Y. M. C. A.

Plans and estimates for the extension of the Parliament Buildings were discussed at a recent meeting of the Ontario Cabinet and will be submitted to the legislature at an early date. It is proposed to erect a wing at a cost of about $500,000.

The police commissioners have decided upon the formation of three new police divisions which will entail the erection of six additional police stations.

The ratepayers have approved a bylaw in favor of a grant of $50,000 to each of four hospitals, the Western, Grace, St. Michael's and the Home for Incurables. This money will be devoted to extending the buildings.

Victoria, B. C.

W. C. Frame, architect, has prepared plans for the new Chinese school to be erected on Fisguard street at a cost of $12,000. The building will be two storeys high, of concrete and brick construction. Work will be commenced at once.

A new building will be erected by the congregation of St. Barnabas church at a cost of $10,000. Rev. E. G. Miller is rector.

Vancouver, B. C.

Plans for the new Vancouver Horse Show building, as prepared by W. H. Milner, architect, of Seattle, are published in the local press. It is understood that the erection of the building will be commenced at once.

Welland, Ont.

The by-law to raise $15,000 for the erection of an additional public school was defeated.

Waterloo, Ont.

The ratepayers have carried a by-law to raise $15,000 for the building of a ward school and $3,000 for the erection of an isolation hospital.

AWARDED.

Black Lake, Que.

P. Belanger, of this place, has been awarded the general contract at $14,055, for the interior finishing of the new Roman Catholic church here. J. St. Hilaire, of St. Romuald, Que., was the successful tenderer for carving and furnishing at $3,000. Ouellett & Levesque, Quebec City, architects.

Moncton, N. B.

The Builders' Woodworking Company, Limited, have obtained a contract for the new theatre to be erected by Torrie & Winter. R. A. Frechet, architect.

Montreal, Que.

The general contract for the new observation ward of the Alexandria hospital is being carried out by Reid, MacGregor & Reid, this city. The following sub-contracts have been let: Painting and glazing, G. Dumont; electrical work, C. LaPierre; roofing, Richardson Simard Company; plumbing, W. J. Graham. E. & W. S. Maxwell, of this city, are the architects.

Outremont, Que.

G. A. Monette, architect, Montreal, has awarded the following contracts for the erection of the annex to the Catholic School for Boys, in Outremont: Masonry, brickwork and carpentry, L. Houle; plumbing, Wm. Pelletier; heating, Cadieux and Briard, all of Montreal.

Toronto, Ont.

J. M. Lyle, architect, has awarded the following contracts for Pickering College, Newmarket: Electric wiring, etc., Bennet & Wright, Toronto; slate roofing, Matthews Company.

The contract for the erection of a new building for the Sixth avenue Methodist church has been awarded to Beachey & Sims. Estimated cost, with equipment, $13,000. F. S. Green, of F. J. Hart & Company, is the chairman of the Building Committee.

Residences

London, Ont.

Permits have been granted to Geo. Hyatt for a two storey brick residence on Lorne avenue; J. Fritz Beck, two storey brick residence, St. George street; Jas. Wallace, two and a half storey brick veneer residence, St. James street; Chas. Quick, one and a half storey brick veneer residence, Briscoe street; B. A. Fitzmaurice, brick residence, William street; F. W. Watts, two storey brick residence, Quebec street; T. Allison, brick veneer residence, Regina street; Mrs. Clyde, one and one-half storey brick veneer dwelling, Wharncliffe road.

Montreal, Que.

Joseph Perrault, architect, has prepared plans for eight flats to be erected on Park avenue for J. H. Dorion.

Alex. MacKay, Oldfield, has taken out a permit for the erection of an apartment house, containing twelve dwellings, on Oldfield avenue, at a cost of $12,000. Architect, J. S. Smith.

H. K. Skelton has taken out a permit for a residence at 102 Crescent street at an estimated cost of $10,320. Architect, Jas. E. Adamson, Coristine Building.

Eric Mann, architect, has prepared plans for an apartment house on Pine avenue, for Mr. David Sperber. Estimated cost, $15,000.

E. M. Renoul has taken out a permit for the erection of a $13,000 residence on Pine avenue. Architects, E. & W. S. Maxwell.

Three frame dwellings on Papineau road, the property of H. Sikel and others, were recently destroyed by fire at a loss of $3,000.

The residence of M. A. Bernier was damaged by fire last week to the extent of $2,000.

O. T. Ranger's house on Ontario street was damaged by fire last week at a loss of $1,500.

Ottawa, Ont.

Permits have been granted to J. W. Featherston for a pair of dwellings on Fourth avenue, cost $4,500; Chas. Rupert, double brick veneer dwelling on Mutchmor street at a cost of $5,000, and H. La Haise for an $11,000 brick veneer house to be built on Rideau street.

V. V. Rogers has taken out a permit for a pair of brick veneer dwellings on Mutchmor street, at a cost of $5,000. A permit has also been granted to James Trumble for a brick veneer dwelling on Nelson street, at a cost of $2,800.

Toronto, Ont.

Plans have been prepared by J. M. Cowan, architect, 65 Adelaide street east, for the erection of a three storey apartment building on McCaul street, at a cost of $10,000. Fire escapes will be provided to the building.

Recent building permits include: Mrs. M. Wright, two storey and attic brick dwelling, Lucas street, $3,500; Wm. H. Coon, pair semi-detached two storey and attic brick dwellings, corner Queen and Herbert, $3,500; R. W. Davis, two storey and attic brick dwelling, near Macdonnell, New Galley avenue, $2,500; R. C. Bustard, two detached two storey and attic brick dwellings, De Lisle street, $4,000; W. C. Locke, two storey and attic brick dwellings, corner Wellesley street and Parkview avenue, $2,600; J. T. Hutson, two storey and attic brick dwelling, Palmerston boulevard, $3,500; H. Hutson, two storey and attic brick dwelling, Poplar Plains road, $3,500; G. H. Weale and Son, two storey brick dwelling, Curzon street, $3,300; W. Hughes, pair semi-detached two storey brick dwellings, Grace street, $4,600; Wilkins & Company, two detached two storey brick dwellings, St. George street, $7,000; John Houden, two and a half storey brick dwelling, Marmaduke avenue, $3,000; F. Courtmanche, two storey and attic brick dwelling, Howard Park avenue, $3,200; F. G. Mara, two storey and attic brick dwelling, Roxborough street east, $6,000.

Vancouver, B. C.
Recent building permits include: J. A. Chisholm, frame cottage, Cotton Drive, $2,100; A. Burton, frame dwelling, Ninth avenue, $2,100; A. Hanson, frame dwelling, Napier street, $2,100; H. J. Hutchinson, frame dwelling, Seymour street, $1,600; J. Morley, frame dwelling, Sixth avenue, $2,200.

AWARDED.

Montreal, Que.
Chas. Bernier, architect, has awarded the following contracts for the erection of three flats on Berri street, for Mr. N. Deslauriers: Masonry, Perrault & Andy; brickwork, Jos. Larose; painting, A. Viallancourt; plastering, N. Depatie; plumbing, heating and roofing, N. Belanger.

Toronto, Ont.
The following contracts have been awarded for a two and one-half storey residence on Whitney avenue for the Rev. G. Jackson: Mason work, Hamilton and Reid; carpenter work, J. A. Howson, West Toronto; plumbing and heating, Power Bros; plastering, Duckworth Bros; roofing, A. B. Ormsby; painting and glazing, F. C. Davies. Cost, $7,000.

Contracts have been awarded as follows for an apartment house on King street west, Parkdale, for Mr. Wm. Anderson, at a cost of $7,500: Mason work, Nobes Bros.; heating, Taylor & Read; painting and glazing, H. Hayden. J. H. Galloway, 77 Victoria street, is the architect.

Mr. Jos. Crang will erect a pair of semi-detached dwellings on the west side of Kendal avenue at a cost of $5,000. J. M. Cowan, 65 Adelaide street east, is the architect.

W. G. Hunt, architect, has completed plans for a $3,000 bungalow at Lorne Park for Mr. F. Kelk.

Business Buildings and Industrial Plants

Amherst, N. S.
Coates & Company's furnishing store was badly damaged by fire last week.

Coldwater, Ont.
The British Arms hotel and Abbott block of three stores were destroyed by fire last week at a loss of about $25,000.

Kingston, Ont.
The ratepayers have approved a by-law in favor of granting the Wormwith Piano Company $10,000 to rebuild their factory.

London, Ont.
It is stated that the Dominion Bank will erect a lagre new building in this city.

Work will commence immediately upon the erection of a new factory for the Murray Shoe Company. The building will be three storeys high and will have a frontage of 50 feet on Richmond street, and a depth of 300 feet.

London, Ont.
The by-law to appropriate $5,000 for a consumptive hospital was carried. The measure providing for the erection of public swimming baths was defeated.

Montreal, Que.
A $5,000 fire occurred last week in the premises of the Berlin Rubber Company.

The John D. Duncan Dairy Company have purchased property on the west side of Mountain street, adjoining their present premises, for the enlargement of their plant. Plans for the new building to be erected on the site have been prepared by MacVicar & Heriot, architects. Work will commence early this spring.

Moncton, N. B.
The grist and carding mill owned by T. W. Colpitts at Forest Glen was recently destroyed by fire at a cost of $4,000.

Milton, Ont.
The by-law to guarantee the bonds of the P. L. Robertson Manufacturing Company for $10,000 has been carried.

Midland, Ont.
A by-law to give E. Brown & Son, carriage manufacturers, fixed assessment was defeated.

Markham, Ont.
The ratepayers have defeated the by-law to grant fixed assessment to the woollen mills.

Neudorf, Sask.
The Home Bank of Canada may erect a branch building in this town.

North Bay, Ont.
The store and dwelling of C. Sandrelli were destroyed by fire last week at a loss of $5,000.

New Westminster, B. C.
Seaton Bros., boat builders, have purchased the Crane yards and will immediately carry out improvements. It is proposed to open a machine shop, wood-working plant and, later, a steel forging plant.

North Vancouver, B. C.
The Bank of Hamilton have purchased a building site at the corner of 1st street and Lawnsdale avenue, where it is understood that they will ultimately build a stone or brick block.

The Bank of British North America have purchased a site on the corner of 3rd street and Lawnsdale avenue.

North Sydney, N. S.
The Amus Theatre was destroyed by fire last week together with other buildings at a building loss of about $5,000.

Ormstown, Que.
The rolling mill, electric light works and other buildings were destroyed by fire last week at a loss of from $10,000 to $15,000.

Prince Albert, Sask.
The lumber sheds, store and office of the William Cowan Company were destroyed by fire recently.

Port Arthur, Ont.
The buildings of B. B. Rogers, Carroll & Thornton were damaged by fire last week.

Quebec, Que.
The premises of the Quebec Wood Specialty Company were destroyed by fire recently.

Summerland, B. C.
A company is being organized by local fruit growers for the purpose of erecting a canning factory. The capital of the new concern is $30,000.

Saskatoon, Sask.
G. P. Barrett, Ottawa, is contemplating the erection of a three storey brick building, 75 by 100 feet, at this place, on Second avenue.

Toronto, Ont.
The new lessee of the Rossin House, Mr. S. H. Thompson, will carry out extensive alterations and improvements to the building at an estimated total cost of $50,000.

Tenders have been taken by Denison & Stephenson, architects, for the erection of a three storey brick block to contain five stores and dwellings in the east end, at the southeast corner of Queen and Howard streets. Construction will be commenced at once.

A two storey brick garage and dwelling will be erected on Kendal avenue by Sydney Small at a cost of $3,000.

A permit has been issued to M. Leamen for alterations to stores and dwellings on Broadview avenue to cost $2,500.

McKinney & Johnstone have purchased a block of property between College and Beatrice streets, where they will erect a block of stores.

The Robert Simpson Company will erect a large brick and stone stable on the property south of the Mutual street rink.

A local firm of builders have purchased 265 feet on the north side of Bloor street, between Markham and Palmerston, and will erect fifteen stores. The expenditure involved is $100,000.

Warman, Sask.
Business buildings of J. McGill, J. H. Knipfel, the Clare Company and others were recently damaged by fire to the extent of $50,000.

Power Plants, Electricity and Telephones

Cornwall, Ont.
Application will be made for the incorporation of the Eastern Electric Railway Company, for the construction of a line from this town to Toronto, passing through the townships of Cornwall, Osnabrook, Williamsburg, Matilda, Edwardsburg, Augusta, Elizabethtown, Yonge, Escott, etc.; also from a point in or near Ottawa to a point in or near the city of Brockville and connecting with the above line. Authority is asked for the issue of bonds to the extent of $25,000 per mile.

Galt, Ont.
The ratepayers have approved a by-law to raise $12,000 for electric light extensions.

Halifax, N. S.
The Halifax County Council have decided to guarantee the bonds of the Halifax and Suburban Electric Company, Limited, to the amount of half a million dollars. It is stated that parties interested in the Waverley Gold Mine are ready to furnish the capital for utilizing the Fall river water power and transmitting to Halifax, via Dartmouth and Bedford, for manufacturing and other purposes.

Lancaster Township, Ont.
Application will be made at the next session of the legislature for the incorporation of the Eastern Ontario Counties Electric Belt Line Railway Company for the construction of a line from this township to the city of Ottawa, connecting with the Lanark Electric Railway, and a branch line from Kenmore to Russell. Power is asked to enter into an agreement with the

Cornwall Electric Street Railway Company for amalgamation with that concern for bonding purposes to the extent of $20,000 per mile.

Moose Jaw, Sask.
A rural telephone company is being organized at Postville, northwest of the city. The principal subscribers are J. A. Maharg, N. E. Harris, J. A. Sheppard, M.L.A., Hugh Lake, Arthur Rathwell, and S. K. Kathwell.

Ottawa, Ont.
A meeting was held recently in connection with the project of a belt line of electric railway connecting the principal towns and villages of the central Ottawa valley and the St. Lawrence front. A charter for a part of the projected line is already in existence and it was decided to take steps to secure authority to construct the remainder. The line would connect Ottawa with Arnprior, Renfrew and towns up the line, then go to Brockville and down the St. Lawrence and back to Ottawa. The extent of the line would be about 200 miles.

Application will be made at the next session of parliament for the incorporation of the Ontario and Michigan Power Company for the development of pawer on the Pigeon river and Nepigon river, etc.

Orillia, Ont.
The Oro Telephone Company are planning considerable extensions. It is proposed to build a line from Coulton and Jarratt to Price's Corner and thence to Orilila, etc. In the meantime the Oro line will be extended into Orillia by the Barrie road.

Port Arthur, Ont.
The by-law to raise $25,000 for further power development of the Current river was carried.

Saskatoon, Sask.
The North-Western Telephone Company have issued a block of $25,000 stock and are planning considerable construction.

Toronto, Ont.
A deputation representing Brantford, Galt and other towns on the Grand river waited upon Hon. Dr. Reaume, Minister of Public Works, last week to ask for provincial aid in making surveys for dams on the river. The cost of the work, it is believed by the Government engineers, would be considerable and four dams might be required. The delegation was headed by Mr. Brewster, M.P.P., Major Craig, M.P.P., and George Pattinson, M.P.P.

Winnipeg, Man.
The Board of Control recently opened tenders for the construction of the power plant at Point du Bois, and decided to refer them to the engineers in charge of the power department, the board of consulting engineers and H. N. Ruttan, city engineer. The tenders sent in were discovered to be below the estimated cost of the plant. The board of consulting engineers visited the Point du Bois falls, and it is expected that the tabulation of the tenders will be completed in time to allow the Board of Control to send in a recommendation awarding the tenders at the next meeting of the city council. The following are the tenders received for doing the different works:—For general works—Wm. Newman & Company, Winnipeg; Thomas Kelly & Sons, Winnipeg; Power Construction Company, Winnipeg; Hanly, Quinlan, Robertson & Company, Montreal; Hydraulic Construction Company, Winnipeg; John Gunn & Sons, Winnipeg. The Hydraulic Construction Company, Winnipeg, is formed for the purpose of doing this work, and is composed of amongst others the following citizens: Ex-mayor Thos. Sharpe, T. D. Robinson, G. H. Strevel and W. W. Collidge. For the building of the transmission cable the following tenders were received: Thomas Kelly & Sons, Winnipeg; Eugene Phillips, Electrical Works, Montreal; Dominion Wire and Manufacturing Company, Montreal; Northern Aluminum Company, Shawinigin Falls, Que. For the erection of the steel towers the following tenders were received: Thomas Kelly & Sons, Winnipeg; Canadian Bridge Company, Walkerville, Ont.; Des Moines Bridge and Iron Works Company, Des Moines; Gould, Shapley and Muir, Brantford; Vulcan Iron Works, Winnipeg; Heenan & Froude, Manchester, Eng.; Manitoba Iron Works, Winnipeg;Riter-Conley Manufacturing Company, Pittsburg; Ontario Wind Engine and Pump Company, Winnipeg; Canada Foundry Company, Toronto. For the building of the electrical transmission system the following tenders were received: Thomas Kelly & Sons, Winnipeg; Power Construction Department, Winnipeg; R. McManus & Company, Hamilton, Ont. The above tenders include all the work on the proposed power plant, but do not include machinery. The estimated cost of the proposed work included above is nearly $1,500,000.

Miscellaneous

Gilbert Plains, Man.
Tenders addressed to W. Walker, Secretary-Treasurer, will be received until February 1st for $15,000 six per cent. 20-year debentures of the Brickburn school district.

North Vancouver, B. C.
The North Vancouver Gas, Heat & Gas Power Company, Limited, are applying for a franchise. The promoters state that if the council approve of the draft bylaw the company will be at once incorporated.

Ottawa, Ont.
Tenders will be received until January 29th for the supply of 160,000 barrels of cement for the construction and maintenance of the various canals of the Dominion. Specifications may be obtained at the Department of Railways and Canals, Ottawa.

Outremont, Que.
Tenders close January 6th with J. Kruse, Secretary-Treasurer, for $10,000 5 per cent. debentures.

Prince Rupert, B. C.
The Board of Trade are considering the purchase of a new fire engine. M. M. Stephens is Secretary-Treasurer of the Board of Trade.

Quebec, Que.
Tenders addressed to the Provincial Treasurer will be received until January 26th for the purchase of $750,000 four per cent. 50-year debentures.

St. Johns, Que.
Tenders are invited until January 15th by J. A. Raymond, Secretary-Treasurer, for the purchase of $70,000 four and a half per cent. 40-year debentures with sinkink fund and interest payable half-yearly.

AWARDED.

Edmonton, Alta.
The contract for the supply of four new street cars recently ordered by the City Council has been awarded to the Preston Car Company, Preston, Ont., at $3,225 each, f.o.b. Edmonton. Other tenders were submitted as follows, f.o.b. Edmonton: Ottawa Car Company, $3,528; Brill Car Company, Philadelphia, $4,050; St. Louis Car Company, $4,985.

St. Catharines, Ont.
Tenders addressed to the Superintendinn Engineer, Welland Canal, St. Catharines, will be received until January 16th for the supply of timber, hardware, castings, oils, etc., for use on the Welland Canal and its branches during 1909. Specifications may be obtained at the office of the Superintending Engineer, this city. L. K. Jones is Secretary of the Department of Railways and Canals, Ottawa.

Toronto, Ont.
The Thorn Cement Company, Belleville, Ont., have been awarded the contract by the City Council for the year's suply of cement at $1.68 in sacks per 350 pounds net, Lehigh brand. Tenders ranged from $1.42 1-2 to $1.85 1-2.

THE POWER BY-LAWS.

By-laws authorizing the various municipalities to enter into contracts with the Hydro-Electric Commission for the supply of power were carried at the municipal elections by Dundas, Simcoe, Chatham, Stratford, Tillsonburg, Port Stanley, Norwich, West Lorne, Comber. The measure was defeated in Brantford, Thamesville and Kingsville.

BUSINESS NOTES.

T. T. Clyde, contractor, Valleyfield, Que., has assigned.

Reive & Bond, plumbers, Standoff, Alta., have dissolved partnership.

Cuin & Rochton, plasterers, Lachine, Que., have dissolved partnership.

Simard & Mercure, lumber dealers, Montreal, Que., have dissolved partnership.

A. McArthur & W. J. McArthur, contractors, Montreal, Que., have registered.

Edinger & McAlpine, contractors, Edmonton, Alta., have dissolved partnership.

Durand Bros., plumbers, Montreal, Que., have registered; also Lavoie & Bro., plumbers, same city.

Perras & Lacasse, contractors, Montreal, have dissolved partnership; also W. McArthur & Sons, same city.

The Clinton Construction Company, of Seattle, Wash., has registered at Victoria, B. C., as an extra provincial company of Vancouver.

Bitulithic and Contracting Limited, Winnipeg, Man., are applying for letters patent for the increase of the capital stock of the company from $150,000 to $200,000.

The Norcross Bros. Company, incorporated under the laws of the State of Massachusetts as general contractors, have been authorized to carry on business in Ontario with a capital limited to $40,000.

The following concerns have been incorporated: The Carson Hygienic Dairy Company, Limited, Winnipeg, capital $40,000; the Selkirk Match Company, Limited, Selkirk, Man., capital $40,000; the Canadian O.K. Grain Shocker Company, Winnipeg, capital $500,000.

Edmund Gunn, 25 Toronto street, Toronto, invites tenders until January 30th for the purchase of the mill, machinery, road bed, marl deposits, etc., of the estate of the Western Ontario Cement Company, Limited, at Attwood, Ont. Full information will be given on application.

Tenders and For Sale Department

City Engineer Wanted

Applications will be received by the Commissions of the City of Calgary for the position of City Engineer for said City, up to and including JANUARY 20TH, 1909.

Applicants are to furnish references and state experience respecting Sewers, Water Works, Street Paving and Concrete Sidewalks, etc.

Applicants to state salary required.

Services to commence on February 15th or before it possible.

H. E. GILLIS,
City Clerk. 2

Department of Railways and Canals

Dominion Canals

NOTICE TO DEALERS IN CEMENT

Sealed tenders endorsed "Tender for Cement," will be received by the undersigned, up to 16 o'clock on FRIDAY, THE 29TH JANUARY, 1909, for the supply of some 160,000 barrels of cement, more or less, required for the construction and maintenance of the various canals of the Dominion and to be delivered in such quantities, at such places and at such times as may be directed,

Dealers in cement may tender for the total quantity required, or for such portions thereof as may suit their convenience.

Specifications, forms of tender and full information can be obtained at the Department of Railways and Canals, Ottawa, on and after this date

The Department does not bind itself to accept the lowest or any tender.

By order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 24th December, 1908.

Newspapers inserting this advertisement without authority from the Department will not be paid for it. 1

City of Regina

Tenders for Regina General Hospital

The undersigned will receive sealed tenders on behalf of the Corporation of the City of Regina, marked "Tender for Regina General Hospital" up till five o'clock p.m., on MONDAY, 1ST FEBRUARY, 1909, for the construction of the new Regina General Hospital, according to plans and specifications prepared by Meyer J. Sturm, Architect, 84 La Salle St., Chicago, U.S.A., which may be seen at the office of the City Clerk, Regina, as well as at the Builders' Exchange, Winnipeg.

Each tender to be accompanied by a certified cheque drawn upon any chartered bank of Canada payable to the order of the "City of Regina" to the extent of $5,000.00, which will be forfeited should the contractor fail to enter into a satisfactory contract when notified to do so, and which will be returned to the unsuccessful bidders when the contract is signed.

The contractor whose tender is accepted will be required to furnish a bond for $25,000.00 by a Canadian or British Guarantee Company.

The City Council reserve the right to reject any or all tenders, and to waive any defects or irregularities therein.

A deposit of $10.00 must accompany any application to remove plans snd specifications from the City Clerk's office and such privilege will only be granted to bona fide contractors for the entire work.

J. KELSO HUNTER,
City Clerk.
Regina, Sask., 28th December, 1908. 4

Agent Wanted

for the best line of Concrete Machinery in the world. A splendid opportunity for an aggressive young firm or individual. Box 136, CONTRACT RECORD, Toronto. tf

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Tenders for Bridge

Tenders will be received by the undersigned up to 12 o'clock noon, on TUESDAY, THE 25TH DAY OF JANUARY, 1909, for the erection of a Steel Bridge over the Saugeen River at a point about 2½ miles East of Port Elgin. Bridge is about 300 feet long. Cement pier in centre to be built, the abutments are nowerected. Plans may be seen at office of County Clerk at Walkerton, or tenderers may submit their own plans and specifications. Deposit of ten per cent. to accompany each tender which will be returned if tender not accepted. The lowest or any tender not necessarily accepted

Dated this 29th day of December, 1909.

P. A. MALCOMSON,
4 County Clerk, Walkerton, Ont.

Sealed Tenders

will be received by the undersigned or by Wm. Lane, Clerk, County of Huron, Goderich, P.O., Ont., until MONDAY, THE 25TH DAY OF JANUARY, 1909, for the erection of the superstructure of

Two Steel Bridges

No. 1, a steel bridge to be erected over the Maitland River on the boundary between Colborne and Goderich Townships, about three miles from Holmesville, a station on the G.T.R. The bridge is to be four spans, each span to be 100 feet clear between the tops of abutment and piers. Pratt truss or five spans 80 feet clear between the top of abutments and piers. Warren truss concrete floor. Roadway 16 feet wide, contractors to state in tender, the difference in cost between 14 and 16 ft. roadway, also difference in cost between Pratt and Warren truss. Coopers Specifications 1905 to apply. A good place to erect about 16 feet from bed of stream to floor of bridge. The bridge is to be completed on or before the 1st day of September, 1909.

No. 2, a steel bridge to be erected on the Lake road, Goderich Township, about 8 miles from the town of Goderich. It is to be one span, 77 feet clear span between the tops of the abutments. Warren truss, roadway 14 feet wide, about 24 feet from the bed of stream to floor of bridge. To be completed on or before the first day of July, 1909. Tenders must be accompanied by strain sheet and marked cheque equal to 10 per cent. of the contract price and payable to the County Treasurer. Should any party fail to carry out the contract, the deposit will be forfeited to the County. The deposits of unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

D. PATTERSON,
Commissioner for Huron County
1 Auburn, P. O.

NEW COMPANIES.

Forwell Foundry, Limited, Berlin, Ont., incorporated, capital $50,000. Incorporators, W. Forwell, I. S. Weber, Berlin, Ont.; A. W. Groff, H. J. Liphardt, and C. Liphardt, all of Waterloo, Ont.

The Charters Lumber Company, Limited, East Toronto, Ont., incorporated, capital $100,000. Incorporators, W. C. Charters, S. L. Slade, R. P. Allen, all of East Toronto, and others.

National Metal Ware Company, Limited, Hamilton, Ont., incorporated, capital $40,000. Incorporators, O. D. Peat, H. S. Lees, L. F. Stephens, Thos. Hobson and J. J. Hobson, all of Hamilton, Ont.

Taplin Timber Company, Limited, Toronto, Ont., incorporated, capital $40,000. Incorporators, V. E. Taplin, New Liskeard, Ont.; J. P. Langley, W. R. Smyth and M. Peer, all of Toronto.

Freeman Lumber Company, Limited, Midland, Ont., incorporated, capital $40,000. Incorporators, J. Hill, F. G. Hill, J. W. Demorest, all of Midland, Ont., and others.

Eagle Lumber Company, Limited, Montreal, Que., incorporated, capital $20,000 Incorporators, L. Villeneuve, Quebec, Que., and A. Beaupre, V. Martineau and Patrick Murphy, all of Montreal, Que.

Rosedale Sawmill Company, Limited, Toronto, Ont., incorporated, capital $40,000. Incorporators, T. H. Hancock, F. H. Hurlburt and Edmund Gunn, all of Toronto, and others.

Simplex Floor Finishing Appliance Company, Limited, Montreal, Que., incorporated, capital $25,000. Incorporators, T B. Gould, J. T. Hackett and J. W. McDonald, all of Montreal.

Dougall Varnish Company, Limited, Montreal, Que., incorporated, capital $150,000. Incorporators, J. S. Dougall, J. H. Dougall, W. A. McQuinass and J. E. Coulin, all of Montreal, Que.

Western Engineering Company, Limited, Montreal, Que., incorporated, capital $100,000. Incorporators, A. J. Brown, R. O. McMurty, F. G. Bush, W. R. Shanks and N. J. O'Brien, all of Montreal.

Floor Planing & Surfacing Company, Limited, Montreal, Que., incorporated, capital $100,000. Incorporators, T. B. Gould, J. T. Hackett, H. Martin, J. W. MacDonald and Kenneth McPherson, all of Montreal.

Clinton Fireproofing Company of Canada, Limited, Montreal, Que., incorporated, capital $30,000. Incorporators, F. L. Gagnon, E. E. Gagnon, W. B. Reddy, all of Montreal, and S. Golliek, of Jersey City.

Crown Scale Company, Limited, Sherbrooke, Que., incorporated to manufacture weighing instruments and other machinery Incorporators, J. C. Clark, P. F. Hazen and others of St. Johnsbury, Vt., and C. W. Cate, Sherbrooke, Que.

Provincial Steel Company, Limited, Cobourg, Ont., incorporated, capital $250,000. Incorporators, Robt. Heath, Biddulph Grange, Staffs, Eng.; F. W. Coolbaugh, Philadelphia, Pa.; N. F. MacNachten, W. L. Allen, of Cobourg, Ont., and others.

Grand Trunk Pacific Elevator Company, Limited, Man., incorporated, capital $1,000,000. Incorporators, F. W. Morse, Montreal, Que., and J. E. Dalrymple, H. H. Palethorpe, W. K. Chandler, T. Gillespie, J A. Stevenson and H. Phillips, all of Winnipeg, Man.

Walker-Fyshe Company, Limited, Montreal, Que., capital $190,000, incorporated as engineers and contractors for all kinds of railway, hydraulic, electrical and other works. Incorporators, D. S. Walker, T. N. Fyshe, W. Sutherland and R. S. Lea, all of Montreal, Que., and F. W. Hibbard, of Westmount, Que.

Carli Bros., Limited, Montreal, Que., incorporated to execute all kinds of work in clay, cement, plastic, staff and Roman cartoon, to mould and model statues of every description and to produce electricity for the purposes of the company only, capital $20,000. Incorporators, V. Carli, A. Carli, C. H. Lippe and others, all of Montreal.

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Contract Record

In which is incorporated

Architect & Builder

A National Journal of Architecture, Building, Engineering, Public Works, Tenders, Advance Information and Municipal Progress.

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The Contract Record in 1909.

This issue of the "Contract Record" marks the beginning of its twenty-third volume, hence a few words to our readers. During the past year, when a policy of retrenchment was almost universally followed, this journal made substantial progress, due in large measure to the constant efforts in the direction of improvement. Our aim has been to make the paper as attractive as possible mechanically and to conduct it on the principles calculated to render it a valuable adjunct to the industry it represents—the general contracting field. While evidence reaches us daily that it is filling its mission and spreading broadcast information of the greatest value to the building trade, the possibilities of further development and a wider field of usefulness are recognized. Our plans for 1909 have been made with a view to taking full advantage of these possibilities and producing the best possible publication.

The improvements inaugurated with this issue include an increase in the number of pages and a change in the color of the paper. We believe the new shade of paper to be more effective for advertising purposes and more pleasing to the eye than the dead white.

The Legal Department, which appears in this issue, will hereafter be a regular feature of the paper and will doubtless be found of much value to architects, contractors and engineers. In it will be reviewed the various decisions which are given in the courts throughout Canada affecting the contracting interests.

The articles in this number by Mr. Peter Gillespie, B.A.Sc., on "The Use of Concrete in Sewer Construction," and by Mr. A. W. Connor, B.A., C.E., on "The Construction of Municipal Bridges," and the plans and description of a moderate cost house by Mr. Alpaugh, are but some of the many contributions which have been arranged for to increase the usefulness of the "Contract Record." As good as last week, last month, or last year is not our policy—each issue as published must be better than the previous one.

The Contracts Department, which has for years been a most important feature of the paper, will be developed even more thoroughly than in the past, and our readers will be given the latest and most reliable information concerning projected works in all parts of Canada. By means of a thorough organization and the best of facilities for securing the news, we are enabled to render an unequalled service. The value of such information, when published every week, can scarcely be overestimated.

The exceptional value of the "Contract Record as an advertising medium has been recognized by the manufacturers and dealers in building materials. A means of frequent communication between seller and buyer is essential, and this the "Contract Record," as the only weekly building paper in Canada, provides as does no other paper.

We anticipate the continued co-operation of our advertisers and subscribers, that the "Contract Record" may reflect the progress and prosperity which the year 1909 promises to bring to the building trade.

A Review and a Forecast.

The year 1909 opens with bright prospects. A period of anxiety in the business world has been successfully passed without any serious trouble and in Canada more than any other country there is a certainty of an unusually busy year to come. Looking back to the year which is passed, there is also good reason for those who are engaged in engineering and construction to feel that they have had a much better season than might have been expected. Although the season opened with a few quiet months, improvement commenced to be felt before the autumn was well under way, and by the close of the year many cities were able to report that in spite of the dulness in building operations during the first few months, the year on the whole had been equal to former years and in some cases better.

Winnipeg is the city to which we have recently grown accustomed to look for an example of expansion. It kept up its pace fairly well in 1908. Like all other Canadian cities it suffered at first on account of the business depression, but was quick to recover. The last half of the year showed a decided increase over the last six months of 1907 in regard to the quantity of building undertaken. The building which was begun and completed during the season amounted in value to about $10,000,000.

Toronto affords an example of moderate growth and is usually a fair average example of what is going on in other parts of the Dominion. In 1908 Toronto showed a slightly smaller value of new building though the actual number of new buildings was greater, indicating that building activity has been increasing although the amount expended has been smaller on account of the business depression. The aggregate value in building was about $12,500,000 against about $14,000,000 in 1907.

In the east and in the west Halifax and Vancouver afford interesting examples of the growth of the country. It might have been expected that in the east, if anywhere, building activity would have been dull. This, however, was not the case. Halifax shows a creditable record With its population of 42,000, its building operations amounted to $730,000, giving an average of $17 per head and the statistics show that the permits issued number one for every 70 citizens. In Victoria.

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with a population of about 35,000, for the portion from which statistics have been obtained, the amount spent upon building was $1,017,000, giving an average of $30 per head, and the permits amounted to one for every 68 persons.

It will be seen therefore that neither in the east nor in the west, neither on the prairies nor in the older settled parts of the country can it be said that there has been much to regret in the record of building activity for 1908. Many of the smaller cities in various parts of the country show large increases in building. Portage la Prairie, Man., is a good example of the growth in the west. The total city improvements there amounted to almost $500,000. In Ontario, St. Thomas gives a good example. The total value of building permits there increased from $161,100 to $226,535.

With records like these to look back upon during the time of financial uncertainty there is good reason to believe that 1909 will see a period of the greatest business expansion which Canada has ever experienced. The good growth of 1908 has laid a financial foundation for expansion and the feeling of confidence which prevails throughout the country will result in the carrying out of undertakings which were held back temporarily. Conditions are ideal for a record of successful development of every description and the check which was given to speculative methods by the season of 1908 has induced a spirit of caution which will prevent reckless undertakings from being countenanced.

For the successful manner in which the season of 1908 has been passed, credit must be given above all to the great natural resources of the country, and, secondly, to the excellent good sense of its people. An expression of these two factors is given by the railroad building which has been in progress and the expenditures upon public works which have been put through by governments and municipalities. The railroads have been responsible for much of the freedom from distress which has characterized Canada in comparison with the United States and other countries. They have employed many thousands of laborers and have provided work for many thousands of skilled workmen in the car building and steel rail shops. Railroad building is now only fairly well commenced in Canada, and 1909 will see it greatly increased. The year 1909 will beyond a doubt be a happy new year for the people of Canada.

Co-operation a Help.

The usefulness of a trade paper is rightly measured by the extent to which it meets the requirements of its subscribers. We ask the several thousand readers of the "Contract Record" to write us and give their opinions of this issue, also stating in what way the paper can be improved, and what other information would be found useful. Consider this a personal request, send us your views, and we know we will find suggestions worthy of adoption.

The Canadian Pacific Railway have created an industrial department in connection with their extensive offices at Winnipeg, for the purpose of encouraging the development of cities, towns and villages along their lines in the West. Mr. F. W. Peters has been appointed to follow up enquiries of an industrial nature and place before enquirers the advantages and opportunities that exist along the company's lines.

Blessed is the man who has found his work and then gets busy.

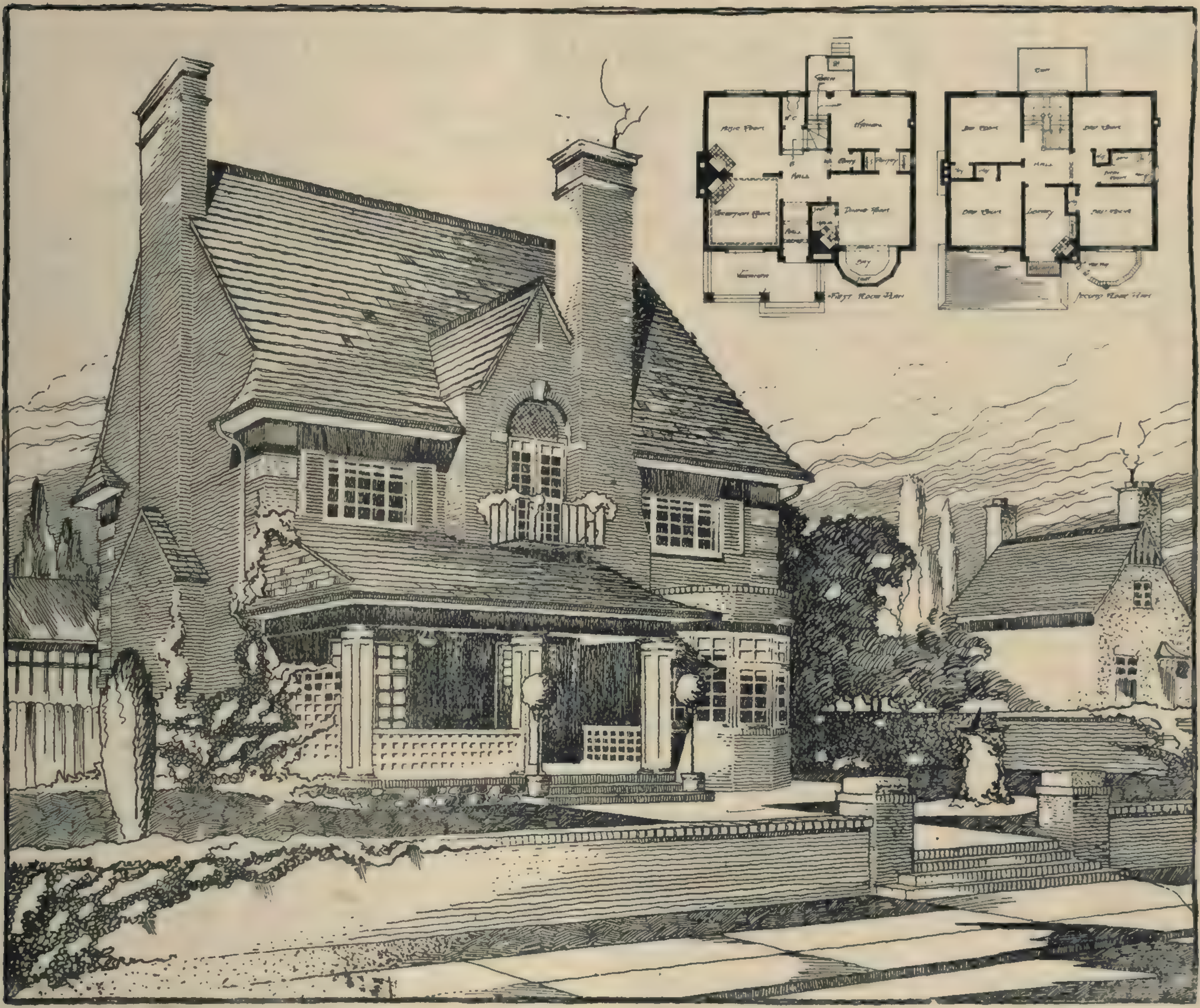
A Country Destined to Supply the World's Food

Annual Wheat Production of Central and Western Canada Within Ten Years Will Be over 500,000,000 Bushels

"Facts," says the Wall Street Journal (New York), "are stubborn things, and they won't down. Mr. Hill and Mr. Harriman are clamoring for higher freight rates, notwithstanding the fact that they are dividing up twice and three times the profit that the Canadian Pacific is dividing among its security holders. These are great, bold, stubborn facts, and Wall Street should study them seriously. The Canadian West in 1884 had only a million bushels of wheat for export, this year it had 100,000,000 bushels, and in ten years it will have 500,000,000. It has a great railroad half completed between Duluth and Dawson City. The Canadian Northern is only 60 miles away from Duluth, and has 1,200 miles more to build before it reaches Dawson City. This year the Canadian Northern has handled 30,000,000 bushels of wheat, and the Canadian Pacific 70,000,000 bushels. In five years these two railroads will haul more wheat to the seaboards of the continent than all the railroads of the United States combined." The Journal goes on to say: "The Canadian West is fast becoming the granary of the world. Kansas grows but twelve bushels of wheat to the acre. Alberta has an average winter wheat production of 33 bushels to the acre this fall, and in the Canadian West there are 200,000,000 acres of virgin soil wheat lands. Alberta and British Columbia possess the greatest quantity of coal in the world, outside, perhaps, of Pennsylvania and its adjoining states. British Columbia possesses lumber resources greater than all the states of the Union east of the Rocky Mountains. British Columbia is, moreover, now recognized as the orchard of the Empire. The Canadian West is now drawing 100,000 of the best farm population of the United States away to the virgin lands to the north. That country is being developed, and be it remembered that the climate of Alberta and Saskatchewan is the climate of Germany, and that Edmonton and Berlin have the same climate and latitude. The Mackenzie Valley will grow finer wheat and more of it than the Missouri Valley or the Arkansas, just as the valley of the Neva will grow it, and for like causes. However unpleasant these facts may be to the people of the States, it is folly to blind one's self to the fact that the Canadian West is destined to supply beef and pork, and cheese and butter, and bread to the world. It has the soil, the climate, and the cheap transportation, and it will have the people."

Elevator owners in Toronto will have to secure a license from the first of the year in order to comply with the elevator by-law. The license fee for the year is $2, and if the license is taken out for the last six months of the year the fee will be $1.

Mr. Charles Hopewell has been elected by acclamation mayor of Ottawa, Ont. Mr. Hopewell is a well-known contractor and builder, and has been prominent for a number of years past in the municipal affairs of Ottawa. During the past year he was a member of the Board of Control.



Elevation and Plans for a Moderate Priced House.—Designed and Sketched by Norman W. Alpaugh.

A Moderate Priced Residence.

The accompanying illustration and plans of a house in Rosedale, Toronto, which will be built in the vicinity of the lacrosse grounds, show an attractive moderate priced building of which the principal characteristics are its simplicity and its adherence to the English class of architecture. Mr. Norman W. Alpaugh, the architect, devotes much of his attention to this class of work and is unusually successful in obtaining pleasing designs. The house in question is to cost $4,000 and is to be of dimensions of 25 x 32 feet. Two things particularly were kept in mind in laying out the plans; first the necessity for moderate cost and, second, the importance of obtaining a home-like appearance both in plan and elevation.

As will be seen, the main feature of the plan is the dining-room, which is 12 x 18 feet, exclusive of the large bay window and ingle nook, which are extremely attractive features of the room. The dining-room ceiling will be beamed, while the hall and reception rooms will have plaster cornices. The bedrooms are all of a good size and a unique feature of the bedroom floor is the location of the library thereon, with doors leading to a balcony which it is intended will be used for holding plants. Each bedroom is well accommodated with closets. The exterior of the building is to be of brick, dark clinker, with white putty joints. The roof will be of slate. There will be hardwood floors in the dining-room and hall and Georgia pine in the reception room and music room. Upstairs the floors will all be of pine. The house will be heated with hot air.

The 49th pier of the Chaudiere dam on the Ottawa River has been completed. This is one of the quickest pieces of concrete work ever done in the Dominion. The promptness with which the piers have been built hastens the work much more than was anticipated. The contracts call for the dam to be finished in every detail and handed over by December 1, 1909. It is expected that it will be done by about midsummer. The committee in charge of the work for the power owners consists of Mr. George Millen, representing the north shore owners; William Baldwin, representing the south shore owners; J. B. McRae, of Ottawa, engineer for the south- shore owners, and William Kennedy, jr., of Montreal, engineer for the north shore owners. The contractors are Quinlan & Robertson, Montreal.

The general offices of "Concrete and Constructional Engineering" have been removed to Dewar House, Haymarket, S.W., and the January issue will be published from that address.

The Use of Concrete in Sewer Construction

Discussion of the Relative Advantages of Brick and Concrete by Peter Gillespie, B. A. Sc.

Whether any new type of construction is destined ultimately to supplant an old and tried one is mainly a question of relative cost and efficiency. Especially true is this where conservatism is not a controlling factor and where the æsthetic is not of prime importance. For many years the use of brick in the construction of sewers of large bore has been almost universal. This material has been well tried, and where good quality and workmanship prevailed, a satisfactory service was obtained Of recent years, concrete and reinforced concrete have come to be used to a limited but a growing extent. The easy manipulation of this material, and the consequent smoothness of bore attainable through its use in sewer construction, its economy in first cost, its resistance to abrasion and its supposed permanency are arguments that have appealed to individuals and municipalities. Cleveland, Ohio, began the construction of concrete sewers twelve or thirteen years ago, and at present is said to have more concrete sewers than any other city of its size in the United States. South Bend, Ind., began the construction of concrete sewers in 1905; St. Joseph, Mo., in 1902; Washington, D.C., has been building sewers of concrete for upwards of thirteen years. Decatur, Ill., during the past year constructed three important concrete sewers, one of them five feet in diameter. Waterbury, Conn., of late has adopted reinforced concrete throughout for its sewer construction. Gary, Ind., the new steel centre of the middle west, has adopted the same material for its larger sewers. Chicago, Ill., Medford, Mass., and Williamsport, Penn., are other American centres of population where cement sewers are in use or in process of construction. The modern sewers of Paris are built of concrete. As early as 1869 thirty miles of such sewers had been laid in that city, and throughout Europe to-day sewers are largely made of that material.

There is little question as to the relative costs of brick and concrete sewers. One authority asserts that concrete sewers can be constructed at from two-thirds to one-half the cost of brick sewers of the same size. At Williamsport, Pa., in 1902, tenders were obtained for sewers of brick, plain concrete and reinforced concrete. The bids on the plain section averaged considerably less than the brick and the bids on the reinforced concrete were the lowest of the three. It is stated in the "Engineering News," March 6th, 1902, that in the reconstruction of sewers necessitated by the New York subway, those made of concrete cost one-third less than those of the same size made of brick. In the same journal for October 17th, 1907, are given alternative bids (brick or concrete) for sewers at Salem, Mass. The lump sum tenders were as follows: Contractor A, reinforced concrete, $11,791, brick, $14,842; Contractor B, reinforced concrete, $17,265, brick, $18,678; Contractor C, reinforced concrete, $19,255, brick, $20,100.

Of late, some doubts as to the durability of sewers in certain cases have been raised by the publications appearing in the technical and industrial press, and particularly that part of it devoted to the interests of the clay workers. The number of cases of sewer pipe failure reported is not large, but to these quite a wide publicity has been given. The ardent advocates of cement, not less than the devotees of brick, have in some cases not been altogether guiltless of unfairness of statement, and it has been very difficult to obtain from either side of the controversy a judicial and perfectly unbiased statement. The tendency to generalize from too few examples, to attach to incidents a much greater importance than they warrant, and to minimize beyond all reason the importance of other essential facts, have helped to becloud the discussion seriously. A few of the recent cases which have served to revive the discussion will be briefly referred to:

In the Nov. 27, 1906, proceedings of the Institution of Civil Engineers, Mr. M. R. Barnett, a member of that body, describes in detail some repairs made by him in the Thirlmere aqueduct, which supplies a portion of the water for the city of Manchester, England. The portion of the aqueduct referred to is about three miles in length and is constructed of concrete. Serious losses of water had occurred in the passage over this portion, and to locate the trouble, an investigation was made. An examination revealed the fact that there were numerous holes in the invert of the aqueduct through which large quantities of water were escaping. The aggregate of the concrete in this particular portion was a very pure limestone and the investigation showed that where the fragments of stone were exposed to the action of the water marked cuppings were visible. The limestone, in short, was being dissolved by the water. The mortar surrounding it, on the contrary, was found to be in excellent condition and stood up conspicuously around the stones. Moreover, wherever the aggregate was other than limestone, the concrete was unaffected by the water. In order to confirm his theories, Mr. Barnett had prepared fragments each of representative limestone aggregate, neat cement and cement mortar of equal parts of cement and sand. These were all suspended in a well containing the water as ordinarily admitted to the aqueduct. Here they were allowed to remain for periods of three and six months. The limestone blocks, then examined, were found in all cases to be reduced in weight, the loss varying from 6.75 to 17.09 per cent. per annum. The neat cement and mortar each experienced an increase in weight, the gains being 5.47 and 3.57 per cent. per annum respectively. On these two last, the water had had no adverse effect.

It is one of the elements of chemical science that limestone is soluble in water containing carbonic acid gas (CO_2) in solution. The water in the instance cited, as subsequent analyses revealed, had carried sufficient carbonic acid gas to render it a solvent of the limestone. This same water had been incapable of dissolving a mortar composed of silicious sand and cement. The incident points to a precaution that should be observed in construction where concrete is exposed to the action of water carrying much CO_2 in solution. This gas is evolved wherever there is combustion of organic matter or decay and is likely to be present in sewage. It would seem to be advisable to avoid the use of limestone aggregate in sewer construction.

At Great Falls, Mont., during the past year, it was discovered by City Engineer Swearingen that sewers of concrete built only five or six years perviously had become unfit for service. One sewer had been built in 1893 of soft brick laid in Portland cement mortar. An examination showed that the mortar in places had become quite plastic, and that the brick too had become partially disintegrated. This prenomenon was particularly observable in regions where exterior moisture was most apparent. Vitrified laterals, it was noticed, were quite intact. The whole matter was investigated by Messrs. Tannatt and Burke, of the Experimental station of the State Agricultural College at Bozeman, Mont. These gentlemen reported as follows:

(1) The disintegration and destructive action of the cement do not come from adulteration of the cement or from the quality of the materials used.

(2) Although it is possible that a limited chemical or physical action of the alkali salts may be a partial cause of the breaking down of the brick, yet the principal cause of the failure is chargeable to the fact that the brick used were too soft and not fit for sewer construction.

(3) The action upon the cement was chemical and the destructive agent came from the outside of the sewer. The disintegration of the cement cannot be charged to any action arising from sewage or sewer gas.

The ground water in the district is heavily charged with "alkali," a colloquial term denoting a combination of some or all of the sulphates, chlorides and carbonates of magnesium, calcium, potassium and sodium. The alkali-charged water percolates through the pervious soil in its search for a depression, until it comes in contact with the sewer shell where possibly by an impervious clayey backfilling, it is to some extent held in place. It percolates through the mortar joints and exerts an influence on both mortar and brick analogous to that of sea water on concrete structures exposed to its action. The salts referred to above are, many of them, found in sea water.

Another investigation, contributing somewhat to our knowledge of the action of alkali waters on cement mortar was made by Mr. W. P. Headden a few weeks ago at the Fort Collins Experimental Station, Colorado. His investigation showed that the most marked destruction of concrete sewer pipe occurred at the interior of the shell of the tile and that at the inner and outer surfaces where the mixture was doubtless stronger in cement the injury was very much less. It is evident that the agents causing the destruction secure access to the mortar in the form of a solution. Knowing that local ground waters contained the sulphate and the carbonate of soda, Mr. Headden made a laboratory experiment which showed conclusively the action of these reagents on cement concrete. He ground a quantity of cement concrete and treated it with a weak solution of these salts. The solution attacked the concrete actively. In view of this fact, it is not singular that cement sewer pipe laid in soil in which such salts occur in considerable quantities, should disintegrate in service. This disintegration is usually most noticeable in those portions of the pipe alternately submerged and exposed to the atmosphere.

Mr. J. G. Jewett, of the U.S. Reclamation Service, gave before the American Society for Testing Materials, at its meeting during the past summer, certain information gained from his own experience with concrete structures in the States of Montana and Wyoming. The structures were culverts and drains and so far as workmanship was concerned were made with unusual care. The same phenomena of disintegration were observable, particularly at and near the water line, and were attributed by Mr. Jewett to the action of alkali-charged ground water. The ground waters carried the usual alkali salts, viz., $CaSO_4$, $Mg.SO_4$, $Mg Cl_2$, and K.Cl. of which the greatest was the magnesium sulphate.

The remedies suggested are two, viz., to underdrain the structure and to secure as nearly as possible an impervious concrete.

On Jan. 23, 1908, Mr. G. G. Wheat, Emmetsburg, Iowa, read before the Iowa Brick and Tile Association a paper in which is made an attempt to prove that cement is soluble in water and is susceptible to the action of sewer gas and sewage. Cases where concrete had disintegrated on exposure to weather are cited and in conclusion the statement that all cement mortar is ultimately doomed to failure if exposed to weather or water, is made. Mr. Wheat is much too wide in his generalizations. Cases of weathering of sandstone, of limestone, of brick and of concrete are by no means rare. Poor workmanship and careless proportioning of materials in the artificial products are quite as likely to prove disastrous as inherent defects in the materials, and yet these contingencies are not even considered by Mr. Wheat. While there are instances, as cited by Mr. Wheat, where sewers have failed, there are many cases on record where they have given very excellent and long service. I am told that in the city of Harrisburg, Pa., which for several years has been constructing sewers of concrete no difficulty whatever has been encountered.

In Cleveland, Ohio, the large 13-foot reinforced concrete intercepting sewer, after several years of service shows no signs of disintegration. The invert is lined with shale brick but neither the arch nor the cement jointing of the brickwork have showed deterioration. In Chicago recently some brick sewers laid in natural cement mortar were broken into after fifty years of service. Neither the brick nor the mortar had shown any decay or impairment from the action of sewage. Taylor and Thompson cite the experience of the city of Duluth. After twenty years of wear, concrete sewers show no appreciable deterioration or enlargement in diameter, while brick sewers laid at the same time, required rebuilding after six or seven years. Unfortunately, the character and quality of the brickwork are not described. A section of these sewers four feet in diameter and two thousand feet long with water running at forty-two feet per second had an invert of granite flags laid in 1 to 1 Portland cement mortar. The flow of water during freshets was very heavy, and after two years of wear the invert showed ridges of mortar between the stones, indicating its remarkable resistance to abrasion. Milwaukee is another western city whose experience with concrete sewers has been very satisfactory. Mr. George E. Zimmerman, a prominent sewer contractor of that city, asserts that he relaid 40 feet of cement pipe put down 25 years ago, and found it harder and better than new pipe. City Engineer Chas. Potesch says that there is in Milwaukee some concrete sewer pipe that has been in use for over 30 years, and that there are now over 200 miles of such sewers in service in that city. At Atlantic Mills, Olneyville, more than 3,000 feet of cement pipe was put in 37 years ago to carry off expended dyes from coloring vats. The dyes contained acids, potash, etc., and were discharged near the scalding point. It became necessary for the city to remove a portion of this pipe to put in water mains. They found cement pipes which had been in use 18 years almost as good as when laid. The cement was Rosendale (natural) and it is claimed that Portland cement would have made a better record.

Mr. Gustave Kaufman, M.Am.Soc.C.E., reports that where the Fleet street sewer, Brooklyn, N.Y., was uncovered while excavating in the early part of 1906 for the Rapid Transit Subway on Fulton street, that city, concrete pipe and vitrified pipe of Scotch make were both exposed. In all cases, the concrete pipes were intact, while the vitrified pipes were invariably cracked or broken. This sewer was laid over 45 years ago. He further asserts that to poor materials and the work of unscrupulous contractors may be traced the failures of cement sewer pipe in that city . "Cement Age" is authority for the statement that the cement sewers of Oshkosh, Wis., have given every satisfaction. Mr. Wheat above referred to, alleges that these cefent pipe have suffered seriously, owing, as he says, to the action of sewer gas. I have no authoritative information as to what the facts in the case are. In view of the experience of these cities, does it not seem premature to condemn concrete construction indiscriminately because concrete sewers or cement posts or cement curbs for reasons not known with certainty, have in isolated cases failed?

Mr. Wheat reports also that at his instance, Dr. Knight, of Cornell College, Mt. Vernon, made a series of tests on a sample of cement tile supplied by him, the weight of which was 73 grams. The tile was first subjected to the action of distilled water for 72 hours. The water was then filtered, and the filtrate evaporated, showing that .0325 gram had been dissolved. The same piece was then left for 95 hours in distilled water. After filtration and evaporation, it was discovered that .039 gram had been dissolved. A third deterioration showed that after 74 hours in city water, the quantity dissolved was .0039 gram. In fourth trial, where the sample was kept for 96 hours in city water, .0320 gram passed into solution. Folowing these assertions, Mr. Wheat draws the quite unwarranted inference that since .0325 gram had been dissolved in 72 hours, the entire cement structure would be disintegrated in less than four years. His assumption is that the rate of dissolving is constant, an assumption not at all justified by facts. If Portland cement concrete were a chemical compound of uniform and constant chemical composition, such an assumption would be justified. On the other hand, it is a mixture of many ingredients, the chemical constitution of some of them being exceedingly complex indeed. That there would be some portions of a Portland cement concrete that would be soluble in water no one doubts. There is for example the gypsum which is added to the clinker to control the set and which is slightly soluble in water. Often there are lime and hydrated lime. The alkaline reaction of water in which briquettes have been submerged, is well known. The probability is, and indeed Mr. Wheat's data point in this direction, that repeated tests such as Dr. Knight has made, would show in time that the soluble portion would in time all be taken up by the water, after which the phenomena would cease. Mr. Wheat's conclusion that "Portland cement is soluble once, and being soluble once can then by soluble an indefinite number of times" is very much wider than his data will warrant. There are too many structures that have stood successfully the action of water for years and too much evidence that can be produced in rebuttal.

SUMMARY.

(1) The limestone in a cement concrete seems to be susceptible to the action of water containing CO_2 in solution.

(2) The so-called alkalies are injurious to cement concrete producing decay, especially where the structure is alternately submerged and exposed to the atmosphere. The action is more conspicuous in mixtures lean in cement. Soft brick is apparently similarly affected.

(3) There is very little evidence that sewage injures Portland cement concrete.

(4) The dangers due to erosion in concrete sewers are probably small. In his very recent work on sewer construction, Professor Henry Ogden, special assistant engineer, New York State Department of Health, states that fears on this ground are entirely unfounded.

(5) The assertion that Portland cement is soluble in water "once and always" is not supported by any great body of evidence.

(6) The argument that would exclude concrete from sewer construction, would preclude also the use of cement mortar for jointing in brick sewers.

(7) Many of the failures of cement sewer pipe are doubtless due to defective materials, poor workmanship and the work of unscrupulous manufacturers.

The H. B. Reinforced Brickwork.

In the early part of December an interesting test was held in Montreal by Mr. F. Hankin, Board of Trade building, Montreal, to prove the strength of brickwork reinforced according to the H.B. system. Mr. F. Hankin, who is sole agent for Canada for the H.B. system, was greatly pleased with the test and asserts that it proved that brickwork thus reinforced is many times stronger than an ordinary wall. Two piers were erected ten feet apart and a hollow 8-inch brick wall consisting of a brick-on-flat, 1½-inch space and a brick-on-edge was then built on the top of these piers for three feet in height, one end projecting to make a cantilever five feet long. The cement mortar was in the proportion of 3 to 1, and was built in 15 degrees of frost, being finished on Nov. 24th. The next ten days were mild and on Dec. 4th the loading was commenced.

The test was loaded with pig iron and the total load on the centre was 17,111 pounds, while that on the cantilever was 4,088 pounls. This load on the centre is equal to the weight of an 8-inch wall 10 feet broad and 22 feet high. Measurements were taken during the loading to ascertain if there was any sinking or giving. After the full load was put on, the measurements showed that the cantilever had sunk ⅛-inch, while the centre had not sunk at all. The wall was then weakened considerably with a batten used as a battering ram and after considerable effort the wall fell.

This test will be of much interest to architects and contractors, as Mr. Hankin claims that the adaptability of this material enables it to lend itself to various forms of construction hitherto impossible in brick work. One claim is that it does away with the necessity for a continuous foundation and when used over window and door openings in place of steel beams or brick arches effects a considerable saving. An 8-inch hollow wall, it is claimed, can be built with the reinforcement and will give a wall that is sound-proof, damp-proof and absolutely fireproof.

When used for factory walls it gives a rigidity which, it is claimed, cannot be obtained in an ordinary brick wall. The material consists of a galvanized wire ⅝-inch mesh of 17G wire and is tested to 32 tons per square inch. It is manufactured in England and is largely used there for public buildings, factories, chimneys, partitions, and also as a bonding fin between concrete work and brick. Mr. Hankin will be pleased to answer the enquiries of any who write to him regarding the system.

The new tunnel under Toronto bay was recently filled with water. The intention was that the water should be pumped from the tunnel for three or four days to clean the tube thoroughly and guarantee a supply of pure water. The tunnel has now been connected with the city water mains and is providing pure water for the citizens.

The Canadian Ornamental Iron Company have removed from Yonge street Arcade to offices in the new wing of the Confederation Life Building.

Jan 6, 1909

In the Courts—Recent Interesting Legal Decisions

Consulting Engineer's Status—Mechanics' Lien Judgments—Injury to a Workman.

Examination of a Consulting Engineer.

In the case of Winger v. Village of Streetsville which recently came before Cartwright, Master in Chambers, at Toronto, a motion was made for an order allowing the plaintiff to examine for discovery, one Fielding the engineer, as an officer or servant of the municipal corporation. The plaintiff had contracted with the defendants to erect a dam on the Credit River. The work was to be performed to the satisfaction and under the personal supervision of Mr. Fielding, consulting engineer, according to plans and specifications prepared by him. All questions arising under the contract were to be referred to "the engineer, whose word shall be final." The plaintiff was dismissed from the work, as he alleged illegally, on the ground that the work was being delayed and done in an improper manner, such delay, if any, having arisen from the neglect of the defendants to furnish the necessary drawings, plans and specifications.

The plaintiff wished to examine the engineer under rule 439 (a), because he was the only person who knew anything about the work. No attempt had been made to examine any other person, but it was agreed that the motion should be treated as if an appointment had been taken out and duly served for Mr. Fielding's examination, and he had declined to attend, or be examined.

The Master said that the question was, whether Mr. Fielding could be considered "an officer or servant" of the defendants. There could be no pretense that Mr. Fielding was "under the control" of the defendants. Indeed, he occupied a quasi-judicial position between the parties, which would render any such contention untenable. The plaintiff therefore would have to examine in the usual way some officer or servant of the defendants, who would have to come prepared to give all the information that the plaintiff was entitled to. The motion was dismissed with costs to the defendants in the cause.

Injury to a Workman.

On an appeal in the case of Simpson v. Webb which was heard in a Divisional Court of the High Court of Justice of Ontario, action had been brought by the widow of one Simpson for damages for his death, caused by the alleged negligence of the defendant, his employer. Simpson was killed while working as a stone-cutter, by the falling of the boom of a derrick upon his head. The plaintiff contended that apart from the evidence as to the negligenec of a fellow-servant, it was negligence per se. on the part of the defendant to allow a boom to hang over the heads of the workmen. The court held that the defendant was not liable. To make him liable it must be shown that there was a defective system and reason to anticipate and guard against the accident which happened. The evidence did not warrant such a finding and besides it was not proved that the defendant's negligence, if any, was the proximate cause of the injury. The appeal was dismissed without costs, the plaintiff undertaking not to appeal further.

Definition of County Bridge.

On appeal re Township of Maidstone and County of Essex which came before the Divisional Court of the H. C. of J. of Ontario, from an order of McHugh, Judge of the County Court of Essex, the matter in dispute was whether the bridge on the road over Pike Creek in the Township of Maidstone, and the bridge on the base line over Pike Creek were county bridges. The appeal was from a decision holding that they were county bridges. The Divisional Court came to the same conclusion. Mr. Justice Clute, in giving judgment, said that in his opinion the evidence warranted them in coming to the conclusion that the work which was done in raising the grade on either side of the bridge formed a part of the structure. The grade of the highway was raised several feet by the deposit of logs and slabs, sawdust and earth. The grade had to be raised in the highway to afford a passage over the creek, and in his opinion the wooden structure, which was about 115 feet in length, and the two approaches, constituted a bridge over 300 feet in length. He could not disagree therefore with the opinion of his honor Judge McHugh, and the appeal was accordingly dismissed with costs.

Mechanics' Lien and Abandoned Contract.

The claims of wage earners under the Mechanics' Lien Act, Ontario, in the case of an abandoned contract came before the master in ordinary at Osgoode Hall, Toronto, recently in the case of Brienzi v. Samuel. The plaintiffs were working for one Howard on a sub-contract for the digging of certain drains in connection with the erection of a warehouse building. Howard's sub-contract was for an amount of $91.80. He abandoned the contract after only a portion of the work had been completed, and the contractors, the Toronto Furnace & Crematory Company, paid him $40 and completed the work themselves. The wage earners claimed that their liens attached on the amount of the whole contract for the erection of the building, namely $6,000, and not upon the amount of the sub-contract. The Master held that the liens attached only upon 20 per cent. calculated upon "the work done or materials furnished by the sub-contractor by whom they were employed."

Supplying Materials Under Abandoned Contract.

In the case of Ludlam-Ainslie Lumber Company v. Fallis which recently came before the Hon. Mr. Justice Britton, the matter at issue was a lien claimed by the plaintiffs upon land belonging to the defendant in Port Arthur, Ont., and upon a house erected thereon. One C. J. Edge contracted to supply all the lumber and do all the work for $3,400. The plaintiffs supplied lumber for Edge and before the contract with the defendant was completed Edge left, after having received in all from the defendant $2,444 on account of the contract. Several liens were registered. The plaintiffs who had supplied lumber after the departure of Edge, which had been accepted by his former foreman, who was continuing the work, also registered a lien. His Lordship said that the defendant knew that the plaintiffs were furnishing materials for his residence and that the contractor was not paying for them. As between men desirous of doing the right thing, there should have been no need for incurring the large costs of a reference. He gave judgment declaring the plaintiffs entitled to a mechanics' lien on the lands and sums in question for the amount of the contract between the plaintiffs and Edge.

Different Methods of Placing Sills on Walls

Practical Suggestions for the Guidance of Builders

There are so many different ways to place sills on brick, stone and concrete walls that the question often arises with carpenters and builders: Which is the best method?

While each method has its own good and bad features, it remains largely a matter for the good judgment of the mechanic to decide, in acordance with the class of work he is doing.

However, the writer has shown five different methods herewith and will try to point out the good and bad features of each, in the hope that they will prove of some practical benefit to those interested.

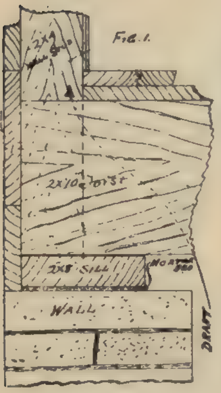


Fig. 1.

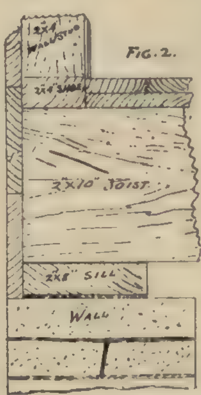


Fig. 2.

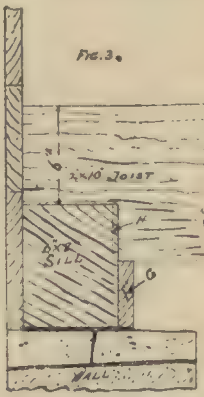


Fig. 3.

There is, however, one very important consideration to be dealt with in framing sills and joist, or any other part of the building for that matter, and that is to provide for the equal shrinkage of the materials used, so that there will not be more cross-grain to shrink at one bearing place than at another.

To make my point clear to the reader, we will suppose that a joist rests upon a 2-inch sill on the wall and on a 10-inch girder at the other end. It will be seen that there would be eight inches more of cross-grain wood at the girder end than at the wall end. As eight inches of wood will shrink about one-half inch, if the joist was placed perfectly level at the time of setting when the girder has become thoroughly dry, the joist will be the one-half inch lower at the girder end. This must be overcome in some way.

We will now take each one of the five different methods up separately and try to find the special features of each one. Fig. 1 is simply a 2x8-inch laid on the wall one inch in from the outer edge of the wall, so that when the 1-inch board or shiplap, as the case may be, is nailed to the studding it will just come flush with the wall, so that the water-table will cover the joint.

It is bedded and leveled up with mortar. The joist is then placed on edge and kept just even with the outside edge of the 2x8-inch sill. The 2x4-inch wall studding stands down on top of the 2x8-inch sill, and the joist are spiked to the studding. This makes a good, strong job, but is perhaps the only good feature about this method. The boarding is nailed to the studding instead of to the ends of the joist; so, therefore, the shrinkage of the joist does not have any effect on them, but it allows a direct draft from the basement up the wall, as seen by the arrow point, which should not be, as it makes a free passage for rats, mice, etc., and also furnishes a direct draft in case of fire. This is another consideration that receives too little thought. Fires would not make such rapid headway if more attention was paid to the placing of draft checks.

The only difference in fig. 1 and fig. 2 is the placing of the 2x4-inch shoe on the top of the joist to stand the wall studding on, instead of allowing them to extend down to the sill. It also breaks the draft up the wall.

Fig. 3 is where the heavy sill is used. The joist can be set on top of it or cut out, as shown. It is much better to cut them out as shown, as this reduces the shrinkage from 18 inches to 14 inches of cross-wood. The dotted line H shows how the sill could be housed out to form a bearing for the joist, or a 1-inch piece, as at G, could be nailed to the sill to form the bearing, instead of housing as at H. The 2x4-inch shoe can be placed, as shown at fig. 2, or the wall studding can be allowed to set down on the sill the same as fig. 1, as desired.

Another consideration that is overlooked is the placing of the sills with a view to preventing of decay. Sills bedded down on top of brick, stone or concrete walls, seem to decay sooner than expected. The brick, stone and concrete draws considerable dampness, and the wood absorbs this dampness and the continual getting wet and dry causes the wood to decay. Let us see if this can be overcome in any way.

At fig. 4 is shown the joist set directly on top of the wall and leveled up with small pieces of slates, then beam-filled with brick to top of joist, as shown by the dotted lines, the joist being allowed to pass through. A 2x4-inch shoe is nailed on top of the joist to stand wall studding on, and the wall boards nailed into the ends of the joist.

At fig. 5, in the writer's opinion, is the best method of the five shown, the joist being leveled up with slate the same as at fig. 4, but the joist are cut two inches shorter to allow for the 2x10-inch to be spiked to the ends. On the ends of the building, where the joist run parallel with the wall, short pieces are cut to run over the wall to receive the 2x10-inch piece, which would run all around the foundation wall. Now brick beam fill, with only one brick thick, laid flush with the inside of the wall. This leaves an air space between the 2x10-inch and beam-filling. Now spike down the 2x4-inch shoe on top all around to stand wall studding on. Do

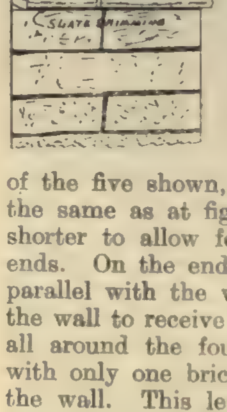


Fig. 4.

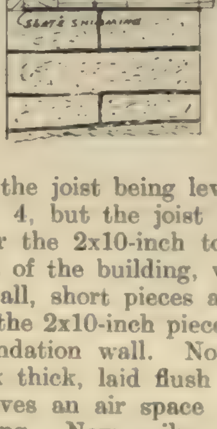


Fig. 5.

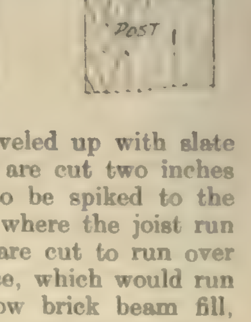


Fig. 6.

not point up the ends of the joist or along the 2x10-inch. Just leave it free on the wall so that any dampness it might collect at any time will quickly dry up. This will be found to greatly prolong the life of the timber. This arrangement also makes a perfectly wind and rat-proof job. Tarred felt or good rosin sized paper should always be placed between the lining floor and the finish floor, to protect the finish floor from the dampness generally present in the basement.

Fig. 6 shows how to overcome the shrinkage where joist have to be carried by a girder. By using the iron joist hangers, these save the necessity of cutting away the strength of the timber by housing them, and are much stronger, as the housings come so near to the bottom of the timber that the strength is lost. At least two inches of the joist should be allowed to pass over the top to provide nailing for the floor.—W. C. A. Stevenson in "The National Builder."

Pointers on Estimating

This is an age of science. Estimating has become a science to a certain extent, not that every estimator is a scientist, far from it. Perhaps I should say a few words as to how estimating is done and trouble avoided; then again it might be just as well to pass on without doing so, as experience is the best teacher; but some counsel may be ventured, and nobody hurt.

In the first place, there is no proportion of time in estimating. An estimator may spend three or four days in figuring a small piece of work and then only require a few hours' time to estimate a large job. Do not tell an architect over the telephone that you can estimate a job in two hours until you have seen the plans. Do not risk your money at too fast a pace. In making up an estimate it is better to keep each factor of a complete estimate separate as much as possible; to finish it and double line it and to make a summary at the end of all the different items or classes of work so that in case any change in specifications is made in any one class of work the whole will not have to be added and corrected from page to page. The same system should be carried out with subheadings. For example, in brick work you may have twenty different items. If the whole is put down as so many cubic feet or thousand brick, there is no way of separating a change without going over the whole job again. Only a few extensions will have to be changed to get the exact cost. Follow the specifications as near as possible item by item, starting with excavating or whatever may come first, keeping each branch of work separate, carrying extensions out to the cents and add the profit at the last, in one item, unless you bid on each branch of work separately, in which case add the profit to each branch.

Always itemize your bid as, all excavating, brick work, cut stone, etc., thereby eliminating any hidden work that may not show on the plans or may not be mentioned in the specifications. It is better to estimate by the cubic foot and square foot than any other way, and saves time in changing to cubic yard or square yard or reducing to any other quantity. Why estimate the quantity of brick by the thousand and then estimate the labor separately when it can be done all at once, and time is money these days. For example, take a 13-inch brick wall around a building 20 ft. x 30 ft. x 8 ft. In the first place we find the linear feet around the building, which is 20 ft. × 2 = 40 ft., and 30 ft. × 2 = 60 ft. and 40 ft. and 60 ft. = 100 ft. around the building by 8 ft. high, or 800 square feet.

Now a 13-inch brick wall is estimated at 12 inches, or three brick wide; a 17-inch wall at 16 inches, or four brick wide; 21-inch wall at 20 inches, or five bricks wide, and so on up. Now we have 80 cubic feet of brick wall—as a rule 20 brick are estimated to a cubic foot. Now the cost of brick, we will say, is six dollars per thousand delivered at the job. The laying of brick we will estimate at, including all labor and mortar, as follows:

⅝ cubic yard of sand	$ 75
1 barrel lime	65
5 hours mason labor	3 00
6 hours tender labor	1 80
Scaffolding and hauling	30
Net	$6 50

We find that we can lay the brick in the wall for $6.50 per thousand. If the brick cost $6 and the labor and mortar, etc., $6.50, we have a total of $12.50 per thousand. Now if 1,000 brick cost $12.50, 20 brick will cost the sum of 25 cents, or 25 cents a cubic foot. This 800 cubic feet of brick wall at 25 cents a cubic foot = 800 × 25 cents = $200.

Now suppose we would face the outside with a pressed brick worth $20 per thousand, take the square feet and multiply by 7, as there are 7 brick to a square foot, which will give the number of brick required, and multiply the cost per thousand by the number of thousand and add to the sum your common brick. The cost of the common brick which you have already taken, added to the labor will pay the additional cost for laying the pressed brick. For example, we have 800 square feet in the above wall, we would require 800 square feet x 7 brick, which would make 5.6 thousands at $20 per thousand = $112., added to $200 = $312 for the wall, faced with $20 brick. If by chance we were to use an enamel brick we would be obliged to add from $10 to $20 more per M. for the cost of labor and laying. Also moulded brick. There are a good many kinds and shapes of moulded brick, and it is very difficult to estimate the cost of these, as generally only one firm makes certain shapes.

The laying of moulded brick is worth from $10 to $20 per thousand over pressed brick, also the amount of brick must be taken into consideration, as a long moulded cornice composed of several kinds of moulded brick can be built up cheaper per square foot than a moulded arch or pilaster cap. Usually they are listed by numbers, as No. 220 return mould cost 75 cents each in Milwaukee, when No. 220 stretchers are only 6½ cents each. The cost of laying either of these brick is the same, which would be at the rate of $25 per thousand or 2½ cents each brick. Moulded headers cost about the same as the stretcher.

In ordinary brick work, openings should be carefully measured and allow six inches all around for extra work and jambs. Thus an opening 7 feet x 8 feet x 13 inches would be estimated as 6 feet x 7 feet x 13 inches, all openings containing less than nine square feet not to be counted.

As a rule the mason has to set the cut stone, terra cotta, iron bed plates and beams, not set by the steel contractor, and is hardly ever estimated by the mason contractor, but should be. In setting cut stone there is a saving of the cubical contents in the amount of brick, which sometimes is worth 50 per cent. of the extra work setting stone, but a charge of from 15 cents to 25 cents per cubic foot should be made for setting.

Municipal Engineering and Construction
Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

Municipal Bridges.—By A. W. Connor B. A., C. E.

With the increased scarcity and cost of lumber, there is a growing demand by the municipalities for permanent bridges of steel or reinforced concrete. We give herewith a few illustrations with brief notes of several of the bridges built during the past season under the supervision of Bowman & Connor, civil engineers, Toronto.

The reinforced concrete bridge is becoming more popular, as its permanence, low cost of construction and maintenance, and its superior appearance are becoming better known. During the past season, which was particularly favorable for concrete on account of the scarcity of work and the low price of cement, we designed about 16 concrete bridges, and in several cases took alternative bids in steel and concrete. The latter were the cheaper, apart from other advantages they possessed. Though some long span concrete arches have been built, the chief sphere of the reinforced concrete bridge is for spans up to about 80 feet where good foundations are obtainable. As they are heavier than steel bridges, larger foundations are required, and in the case of an arch also it is necessary to provide for taking up the thrust. It must not be forgotten that a concrete bridge requires as much care in the design and details of construction as a steel bridge. There have been a number of failures due to carelessness in this respect. A concrete arch suitable for one location might be both unsuitable and unsafe in another, where there was a difference in the height of the roadway above the foundations, or in the character of the ground. The arch is really more complex than the ordinary steel truss, and should be designed by an expert to suit the requirements.

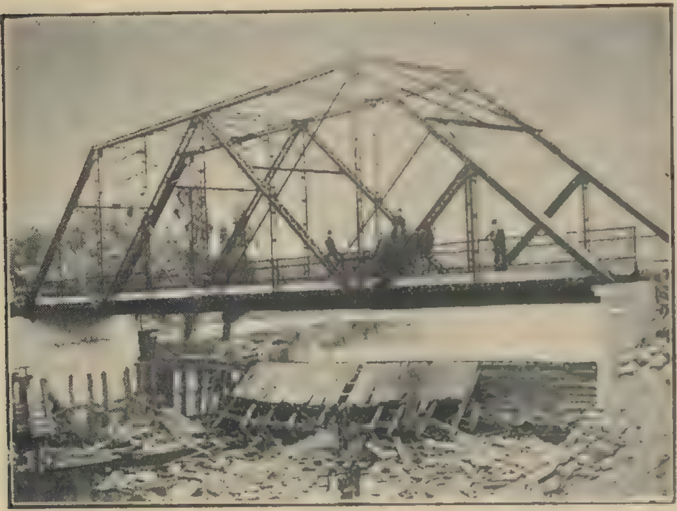


Fig. 1—Rivetted Latice Span, 138 ft. long, 16 ft. Roadway.

Concrete bridges are built either as arches or flat top culverts. The latter may consist of a solid slab or of a slab carried by reinforced beams below, or on either side see fig. 2). This type is for short spans where there is not much head room. With the arch bridge, the roadway is usually carried over the arch by filling up the space between the spandrel walls. In larger bridges the floor is carried on a reinforced concrete slab supported by subsidiary beams or arches. A covering of cinders and clay is often put over a concrete floor to relieve it of shock.

As the concrete in an arch or beam is under considerable compressive stress, it is essential that the cement, sand and stone or gravel be of the best quality, and properly mixed and placed under competent supervision. There is no brand of cement that is safe to use without testing, as they all vary.

The bridges illustrated here were designed for a live load of 100 pounds per square foot of floor, and for a concentrated load of from eight to ten tons distributed on two axles eight feet apart. The dimensions of the concrete and the amount of reinforcing steel were so proportioned by calculation from the elastic theory, that under every possible position of the moving loads, the total stress in the concrete and steel should not exceed 500 and 16,000 pounds per square inch respectively. The size of the abutments was also proportioned according to the nature of the ground, so as to take up the vertical load and horizontal thrust. The foundations must be be rigid for an arch.

A concrete bridge can be built with ordinary labor under competent supervision, except that carpenters are required to build the forms. These forms must be true and rigid so as to carry the weight of the concrete as a liquid without appreciable deflection until it has set. The concrete is reinforced with steel because it is weak in tension but stronger in compression than steel in proportion to its cost. As no reliance can be placed on concrete in tension, and but little in shear, it is essential that the steel be properly placed to take up these stresses.

Plain rods with heavy wire stirrups bound to them, or one of the patented bars of which there are several on the market, might be used for reinforcing. The Kahn trussed bars and cup bars were used in the bridges here described. These bars have the advantage of having the shear members or stirrups rigidly attached, and shipped with them properly arranged, so that there can be no mistake made in the field. The cup bars were used in the spandrel and wing walls to prevent temperature cracks. It is fortunate that the coefficients of expansion

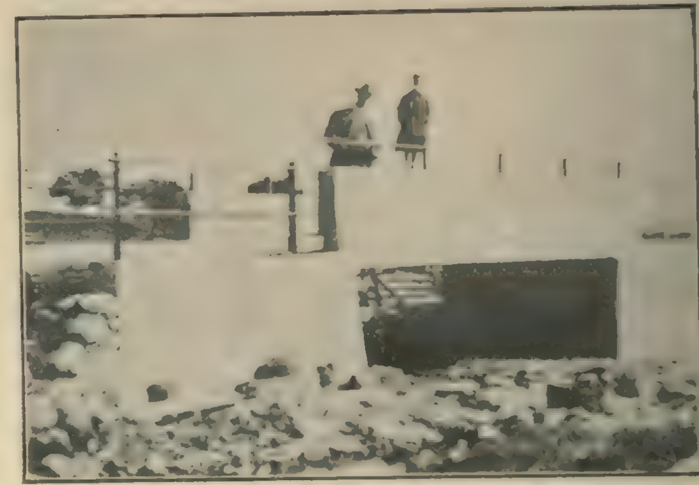


Fig. 2 Flat Top Culvert built on a skew.

of steel and concrete are very nearly the same, as otherwise steel and concrete could not be used together.

The concrete in the arch ring or in the slabs or beams was mixed in the proportions of 1:2:4, and in the foundations and walls in the proportion of 1:3:5. The upper inch of the floor slab was finished with a mortar of 1:2 of sand applied before the remainder had set. The top of the arch was also waterproofed with a similar mortar. A good appearance may be obtained without plastering or otherwise treating the surface, if care is taken to have all the forms carefully built with planks dressed all to the same thickness.

The tops of the spandrel walls were finished with a coping 2 x 6 inches and on top of this was a gas pipe railing carried on steel angle or beam posts embedded nine inches into the walls. A concrete railing, either simply panelled or built up of cast posts, would add considerably to the appearance of the bridge, but would be more expensive.

The following is a brief description of several bridges recently erected:

(a) 15-foot arch at Ponsonby. This is a circular arch with a 5-foot rise. The total length of the bridge is 35 feet, and the clear roadway is 20 feet. There is a panelled concrete railing. There were about 100 cubic yards of concrete and 1,600 pounds of steel cup bars. The cost of this bridge was about $530.

(b) 20-foot arch at Birge's Mills. This is a circular arch with a rise of 3 feet one inch. The spandrel wall is 23 feet long and there are wing walls 10 feet long. The clear roadway is 14 feet. There were about 190 cubic yards in a pair of these, built by C. Mattaini, of Fergus, for $1,125.

(c) 30-foot arch at Speedside. This is a circular arch of 10 feet rise. The roadway is 14 feet clear and the wing walls are 10 feet long. There were 120 cubic yards of concrete and 2,500 pounds of steel. The bridge was built by C. Mattaini for $860.

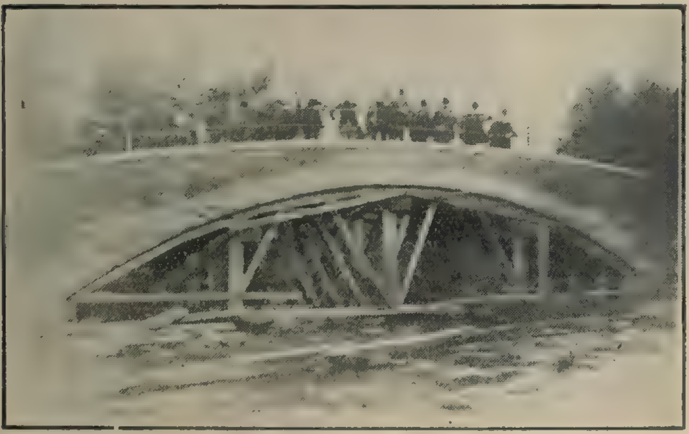


Fig. 3—50 ft. Circular Concrete Arch, Showing False Work.

(d) 42-foot arch at Durham (see fig. 4). This is a circular arch with a radius of 26 feet 6 inches and rise of 10 feet 4 inches. The roadway is 40 feet wide and wing walls flare out to meet retaining walls containing a filled roadway 60 feet clear. These retaining walls are about 16 feet high. About 550 lineal feet were built under a separate contract from the bridge proper. The bridge with wing walls contains about 320 cubic yards of concrete and 15,000 pounds of steel, and was built by Crowley & McDonald, of Rostock, for about $2,550.

(e) 50-foot arch at Eden Mills (see fig. 3). This is a circular arch with a radius of 45 feet and a rise of 7 feet 5 inches. One wing wall is 20 feet and the others are 10 feet long. The roadway is 14 feet clear. The foundations are on rock about 4 feet below the stream. As the water flows about three miles an hour a centrifugal pump was required to keep the water out of the coffer dams during the placing of the concrete. The work contains about 194 cubic yards of concrete and 5,000 yards of steel. This bridge was very well finihsed by the contractor, Walter Davies, of Stratford. The price was $1,334.

(f) Two flat top culverts of 12-foot and 21-foot 6-inch spans near Clifford. The 12-foot culvert is a solid slab 12 inches thick reinforced with Kahn bars. The total length of the structure is 27 feet. The slab rests on abutments 18 inches thick. The other culvert (see fig. 2), is an a skew. The 12-inch floor slab is carried by two reinforced beams 42 inches deep, which also serve for the hand-railing. The slab is reinforced in both directions, and rests on abutments 18 inches thick. This type of bridge gives the maximum clear waterway. The two were built by C. Mattaini for about $1,300.

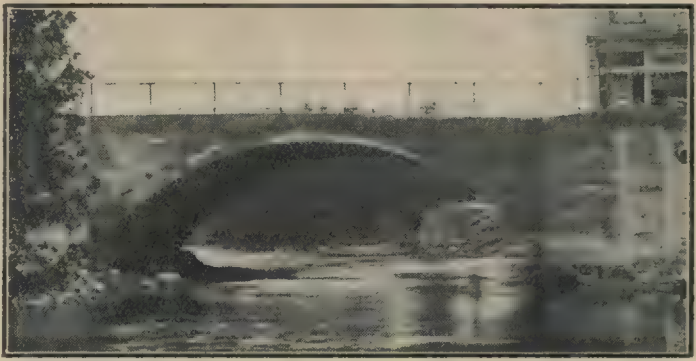


Fig. 4—42 ft. Circular Concrete Arch.

We illustrate but one type of steel bridge in this article. It is a rivetted lattice span of 138 feet, with a 16-foot roadway, and concrete floor, built at Mount Forest (see fig. 1). The floor is designed to cary a live load of 100 pounds per square foot of floor or ten tons on axles 8-foot centres. The trusses are designed to carry only 80 pounds per square foot, as the bridge is never likely to be fully loaded from end to end. The unit stresses allowed are somewhat less than is usual. Cooper's specifications are usually followed for highway bridges in this country. These specifications allow double the permissible live load stress for the dead load. Sixty-six per cent. extra only was allowed for this bridge. Now that concrete floors are generally used instead of wood, the dead load forms a much larger proportion of the total load than formerly, and consequently it is felt that the excessive permissible stresses (25,000 pounds per square foot) for dead load should be reduced. The collapse of the Quebec bridge and experiments recently made would confirm this view.

Moreover the extra steel required is put in at but slight extra cost. As the shop work and erection is the same in either case, the extra material in the trusses will cost about one-fifth of the cost per pound of the finished structure. The extra thickness of material wall also adds to the life of the bridge.

Mr. C. W. Noble, formerly of Winnipeg, has removed to Toronto, where he has assumed the general management of the Preston Metal Roofing and Siding Company.

Among the Toronto people at present travelling in Italy is Mr. W. J. Hynes, the well-known contractor, 16 Gould street.

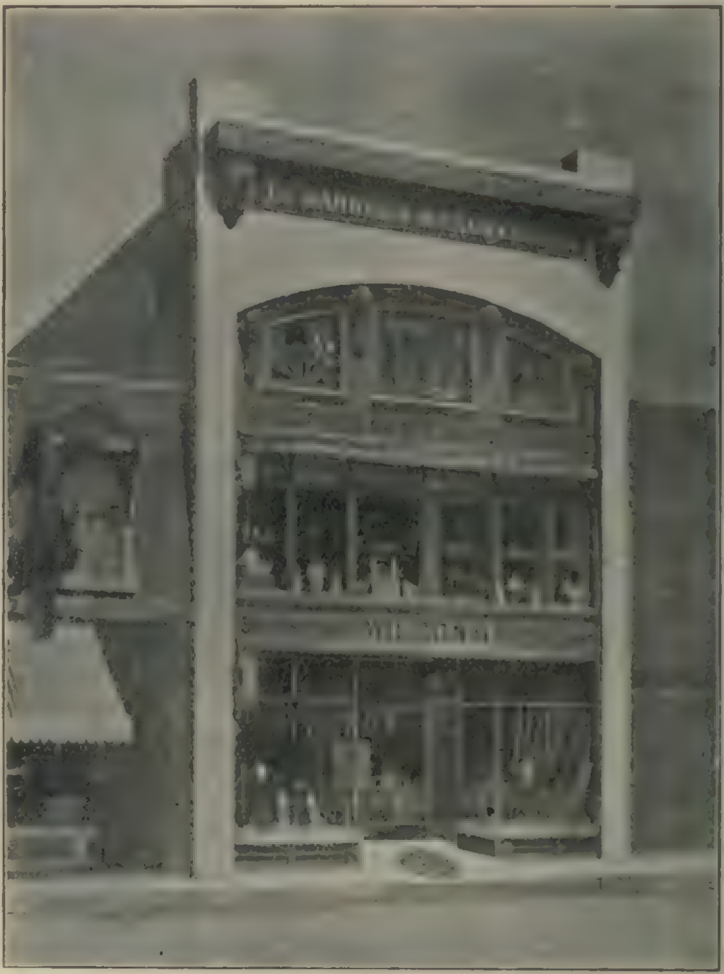
CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.]

Lighting a Display Window.

A question which has been given much attention of late years is that of providing sufficient light for the interiors of stores and also the matter of affording the amplest amount of window show space which can be obtained with a given frontage of store. The problem has been approached from many points of view and numerous interesting solutions have been obtained. A noticeable feature of the majority of these solutions is the doing away with the large central door, reducing it to the smallest proportions compatible with its use and devoting all the store front to show purposes.

The store of the Harold A. Wilson Company, 297 Yonge street, Toronto, which is illustrated herewith, presents an interesting solution of these problems. The show window space has been made just as large as the whole front of the building and by providing unobtrusive window divisions an effect of an almost complete glass front is obtained. The front of the store has also other attractive features from an architectural point of view. It is treated in a simple manner, which is calculated to attract and please the eye of the passer-by. Instead of dividing the front into strongly marked sections, representing the different floors, the divisions are placed in such a manner as to make them almost unnoticeable. The main feature which strikes the eye is the high and simple arch surrounding the glass front. The arch itself is also treated in a simple manner and one of its interesting features is the attractive subdivision of the upper section of the windows. A further feature of the front is the manner in which electric signs have been employed. An effort was made to illuminate the plastering of the building as much as possible. This was done by means of electric signs, and an effect both striking and attractive has been obtained. The interior of the building is flooded with light by the large amount of glass at both ends, the eastern end of the building having been treated in a manner similar to the Yonge street front. The architects for the building were Messrs. Chapman & Mc Giffin, 59 Yonge street, Toronto.



Lighting a Display Window and Store.
The Harold A. Wilson Building, Toronto.

Ventilating School Buildings

Whilst of late years much has been done to improve the curriculum, administration, lighting, cleanliness, etc., of our schools, yet very little progress has been made to improve their ventilation, said R. G. Kirby, A.R.I.B.A., M.S.A., in a recent address before the Royal Sanitary Institute Congress.

Of the many causes which bring about mental fatigue, lassitude, headache, inattention, so often noticeable in children towards the close of the day's studies, there is none perhaps which contributes more to this end than the want of proper ventilation.

By ventilation, we do not mean putting into a building certain appliances either mechanical or otherwise, but the passing through a building of sufficient fresh air to maintain it in a state of purity to the general comfort of the occupants.

Among different systems of ventilating schools the following "Natural Systems" are frequently used, although they might be improved upon greatly:

(a) By means of fresh-air inlets in walls, and in ventilating radiators and stoves fitted with regulating flaps. Foul-air outlet openings in ceilings connected by means of tubes to so-called roof extractors either on the ridge or "concealed."

This system, which appears to be largely adopted, will be known to most of us by its failures and want of system, and thereby want of ventilation.

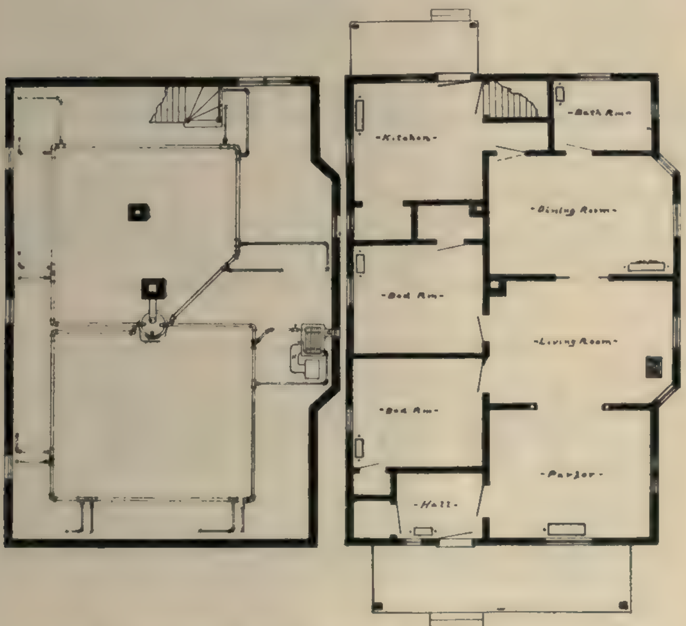
(b) The open-air system, such as may be found in Germany and at "the Cloisters," Letchworth, where really no ventilation in the ordinary sense takes place. Whilst this building has many advantages from a hygienic point of view, yet I do not think the idea could be adopted for the average school of, say, 300 to 500 scholars without enormous cost, but, at the same time, its possibilities should not be overlooked. The result of this scheme is that sufficiently warm and completely fresh air is supplied to each student without the danger of it becoming vitiated.

(c) Another system, somewhat on the lines of the first one, as regards inlets, and having the foul-air outlets in the ceilings connected to a roof turret by ducts formed of wood framing and plaster.

The turret is fitted with an inner framing, the openings of which are covered with silk cloth flaps which remain closed on the side of the wind , and easily open with the current of air passing through the ducts. An outer framing is fitted in the usual way with louvred openings to protect the inner from the weather. The system has proved successful, but is capable of improvement.

One Pipe Circuit Heating System

A heating system which, on account of its neat appearance and the use of less material, will appeal to many prospective builders and house owners is suggested by P. W. Rathbun in the "American Carpenter and Builder." The system effects no saving in cost, as larger pipe and fittings must be used, while with a two-pipe system of water heating much smaller pipe and fittings are used thereby making the cost of both systems about the same at time of installation.



Plan of One Pipe Circuit Heating System.

From an engineering standpoint the one pipe circuit system requires a wider experience, also considerable caution to perfect a proper installation. The flow main at boiler should rise up as near as possible to the ceiling of basement, circling around the entire or a part of basement to the return connection, at all times having a pitch of at least 1 inch in every 10 feet down in direction of return connection. All branches should have a pitch of ½ to ¾-inch down toward mains. Great care should be taken to see that the main equals the combined areas of all flow branches taken therefrom, and the main nowhere in the circuit is to be reduced in size, returning to boiler same size as it leaves.

The greatest trouble with one-pipe systems now being installed is that the mains are, in many jobs, too small to give satisfaction and convey the proper amount of hot water to all radiators on the job. All flow connections should be taken off the main by the use of a reducing tee tilted to a 45-deg. angle or with opening facing up on which place a nipple with a 45-deg. or 90-deg. elbow, then run branch over horizontally to a point where a vertical riser connects to the valve at radiator. Return connections should be taken from the other end of the radiator, drop vertically, and then with a slight pitch down, run over to the side opening of the other tee, which should be placed in the main as shown right after the flow tee.

As will be noticed by radiation schedule, the author has figured a 38-inch dinging-room radiator with warming closet, which is sure to pay for itself many times over by the convenience and comfort derived from same. In the living room indirect radiation has been figured to ensure good ventilation; indirect radiation is from a coil hung from the basement ceiling enclosed in galvanized iron boxing with connections to both cold and warm air ducts in such a manner that the cool, fresh air from exterior will enter and circulate around and through the radiator before passing into warm air duct and up into the room.

When figuring necessary boiler capacity, add 75 per cent. to indirect radiation and 50 per cent. to the actual direct radiation to derive the proper rating of the boiler required, which in this case makes a total capacity of 800 square feet of heating surface.

Schedule of Radiation.

Rooms	Height	Kind	Amount	Deg.
Reception hall	38″	Direct	35′	70°
Parlor	20″	Direct	84′	70°
Living room		Indirect	140′	70°
Dining room, with warming closet	38″	Direct	70′	70°
Front bedroom	32″	Direct	40′	65°
Back bedroom	32″	Direct	40′	65°
Kitchen	38″	Direct	70′	65°
Bath room	44″	Direct	32′	75°
Total, square feet				511

Pertinent Plumbing Questions.

Evidence frequently comes out showing that study is being given to the highly esteemed modern system of plumbing with the one purpose of making changes in it, says the "Plumber and Steamfitter." The charge that the desire for the change is solely for the purpose of cheapening the application regardless of the sanitary effect fails. We have received the following communication, which bristles with pertinent inquiry, and present it with the hope that the information sought may be forthcoming in the comments which we invite upon it. It comes from a well informed man as well as a practical man, and is worthy of the consideration of all who stand for a plumbing system of a high sanitary efficiency, whether of the best present arrangement or of one on a rearranged design, that must stand all tests acceptably.

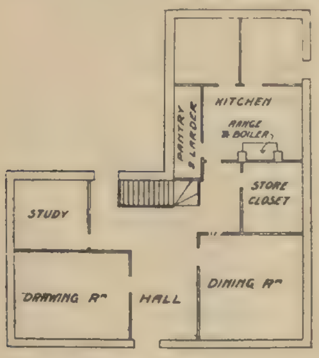
If sewer air does not carry the deadly bacteria in sufficient number to be dangerous, is it possible that the other features and factors in sewer air make impossible any simplified plumbing by the use of safe seal traps without the vent pipe system now universally used?

The waste lines should always be run through the roof, but omit the front wall or intercepting trap, so as to have alternately up and down currents in the house stacks. When the warm water from a bath tub or the kitchen sink passes down the stack, the air in it must go ahead of it to the sewer, drawing fresh air behind it to dilute whatever atmosphere may have been in the house drainage system, and thus purifying it. When the sewers have plenty of air inlets, the stack warmed by the warm water passing through it will reverse the air current and a dilution from the air in the sewer proper will be made. This seems to be about what would take place in the house drainage system, and the charge that the air would be deadly if it leaked into the house seems to be overdrawn, though no one would advocate its entrance. If objection is made to risking the use of sewer air the intercepting trap and fresh air inlet certainly can be used, and then both the up and down currents through the house drains would be as pure air as could be found out of doors.

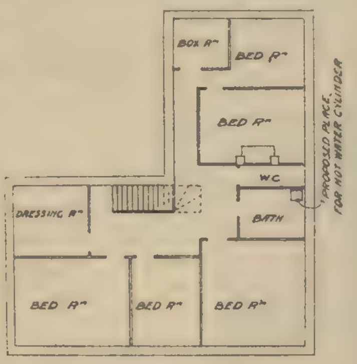
Some Heating Questions Answered.

An English exchange contains the following interesting enquiry from a correspondent, and reply:

"Herewith I give sketch plans of a house. (1) Which would be the best and cheapest way to get the hot-water supply to bath, and which would be the best place for the hot-water cylinder? (2) Would it be in the bath room, where it is proposed to have a linen press, so that it could dry linen and wet towels, etc.? (3) Which is the best timber roof truss for a house of this shape? (4) It is desired to have half-dormer windows on the top floor—would a collar-beam truss be suitable? (5) Which is the best form if half-dormer not specified?"



GROUND FLOOR



FIRST FLOOR

(1) In a house of the size stated, from the cooking-range in winter and from a gas-heated water circulator in summer. For the latter a separate flue in the chimney is needed to take away the gas fumes, but this flue can also be used to ventilate the kitchen by an opening at the cornice. The gas water-heater is not a "geyser," but an enlargement from that type. (2) The bathroom is the best place for the hot-water reservoir, and let it stand open to the room. Towels can then be placed on it, where they will dry sooner than on a rail of hot-water pipes. If heat is desired in the press itself, lay a pipe from the cylinder to the pipe supplying the taps, and fit a stop-cock to each end of the heating pipe, and an air-escape pipe at its highest point led up to a level higher than that of the cold-supply reservoir. (3) A hipped roof; if you think the walls are not strong enough to stand up to the thrust, buttress the quoins with 23-inch by 4½-inch piers, and spread the pier footings to a yard by 9 inches. The bricks from the gables will be more than enough for this. (4) Yes. (5) King-post truss, with hipped ends, and all chimneys on inside walls; this needs brick walls the full height of the first floor. As cost seems to be important, a mansard roof could be used for all the top floor. In comparing costs, the basis must not be builder's cube, but the cubic feet, or better, cubic yards of space in the rooms and the square yards of floor.

Effect of Light on Radiators

The effect of height upon the efficiency of a radiator has been determined in favor of short vertical cylinders, which, according to Baldwin, are presumably the best that can be devised for giving off heat. If they are increased in height, say two or three times, they will do less duty since the air in contact with the upper parts will be warmed by the lower part as it passes upward; and, therefore, is not capable of extracting as much heat.

The higher the radiator is, the lower its efficiency per square foot of surface, and 36 or 38 inches has been established as a fair limit of height.

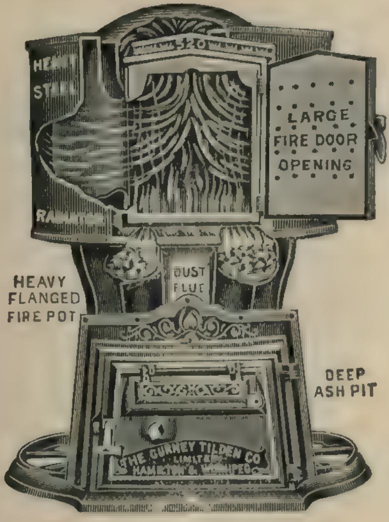
It has been demonstrated that with radiators of the same height and same dimensions no difference could be traced, due either to material or thickness. With radiators of the same material and the same height, but of different depths, or with varying number of tubes, it was found invariably that higher results were obtained from the thinner radiator, or those with the fewest rows of tubes. In these tests it was also found that the amount of heat given off increases very much faster than the difference in temperature between the steam inside and the air outside. With radiators of the same form, but of different heights, the lower the radiator the more efficient. From these experiments it is deduced that the reason lower radiators were more efficient than taller ones was that the tubes of the latter were too closely spaced, since the air in its passage upwards reaches nearly its maximum temperature in a short distance, and from that point onward absorbs but little heat.

Connection of Ontario Architects.

The annual convention of the Ontario Association of Architects will be held in the association rooms, 96 King street west, Toronto, on Tuesday and Wednesday, Jan. 12 and 13. There will be an exhibition of photographs of recent work, which will opened an Tuesdoy at 1 o'clock. The convention will be opened at 2 o'clock. The first feature will be the presentation of the president's address, after which reports will be read by the registrar and the treasurer. Reports of committees and chapters will then be presented, after which a report will be read by Mr. D. B. Dick upon the International Congress of Architects at Vienna. A paper will also be read during the afternoon session on Tuesday by Mr. Walter J. Francis, C.E., of Montreal, on "Reinforced Concrete." This will be followed by discussion.

On Wednesday a drive around the city will be taken in the morning to visit the principal buildings of interest, and luncheon will be served in the club rooms. A business session will be held in the afternoon at which Mr. A. F. Wickson will read a paper prepared by Mr. C Francis Osborne of the University of Pennsylvania, upon "Architectural Education." This will be followed by a discussion. At 4 o'clock a public illustrated address will be delivered by Mr. W. A. Langton on "Styles in Architecture," to which all who are interested in architectural development in Canada are invited. At the conclusion of the address the convention will be brought to an end by the election of new members of council, and a meeting of the new council to elect officers. The meetings of the convention will be open during the reading of papers and friends are invited to attend them.

No Running Up and Down Stairs



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The Use of Sawdust in Mortar.

Sawdust is now sometimes used in mortar, where it forms an excellent substitute for sand. In some localities it is impossible to obtain good, clear, sharp sand suitable for use in the composition of mortar. The latter has the advantage of being lighter, and renders the mortar not only easier for the laborers to carry, but, being only one-half the weight of that mixed with sand, is much better for ceiling, as it is less apt to fall off. Mortar made of quicklime and sawdust in place of sand, and mixed with a proper proportion of cement, makes an excellent mortar for brick or stone work. Sawdust enters largely into the patent plasters.

By the use of these new inventions in plaster rapid building is greatly facilitated, as there is no waiting for mortar to season; the composition, being all prepared, has only to be mixed with water, when it is ready for use. There is also no delay in waiting for the plaster to dry, as it dries immediately and soon becomes as hard as stone; the plasterer can, therefore, be directly followed by the inside finishers.

Previous to the introduction of the new varieties of plaster came improvements in the styles of lathing, and there are now many excellent kinds of metal lathing upon the market, each laying claim to some special advantage over all others.

With the new styles of plaster and metal lathing and by encasing floor beams and posts in fireproof cement, and filling all interstices between walls and floors with "mineral wool," it is possible to-day to make even a frame house practically fireproof; particularly if, in addition to other precautions, the roof be of slate or metal, preferably the latter, as slate is apt to crack and break if subjected to intense heat.

The street cleaning department of Magdeburg has recently made successful experiments with a new sand-strewing waggon. The waggon spreads rapidly an even layer of sand on the streets which, in the case of asphalt paving, is of great benefit, in that it minimizes the slipping of the horses when the streets are either extremely wet or frozen. This has heretofore been done in German cities exclusively by hand. The apparatus is worked by the driver and can be adjusted to strew a layer of sand or gravel from 6 to 16 meters (19.68 to 52.49 feet) wide. The machine has been taken over by the city.

Every mechanic should remember that there is nothing better for burns and scalds than the white of an egg. It is the contact with the air which gives the extreme discomfort experienced from the ordinary accident of this kind, and anything that excludes the air and prevents inflammation is the thing to be applied at once.

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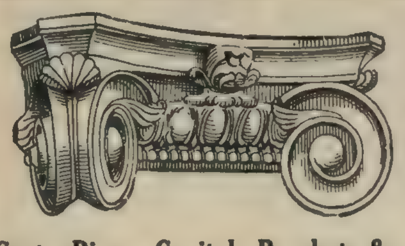

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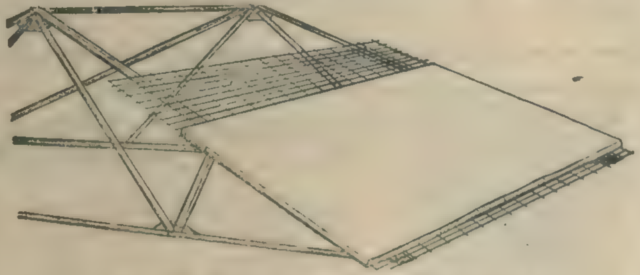

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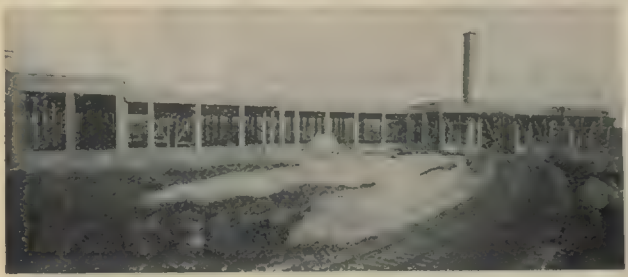

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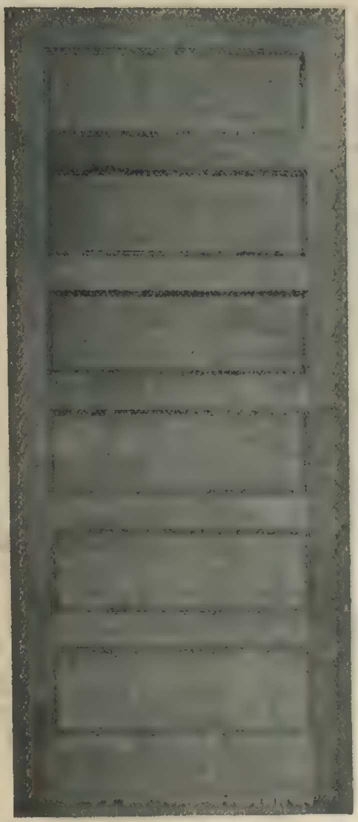

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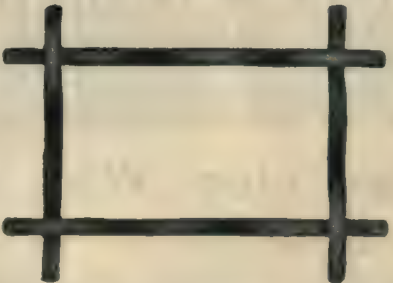

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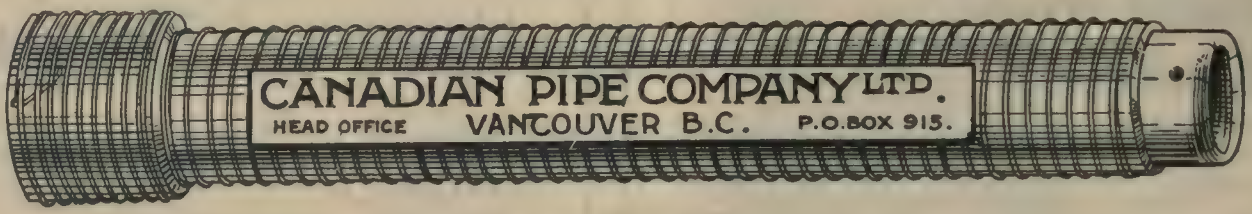
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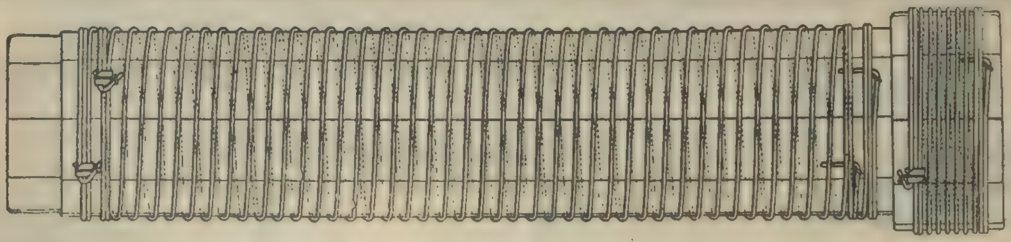

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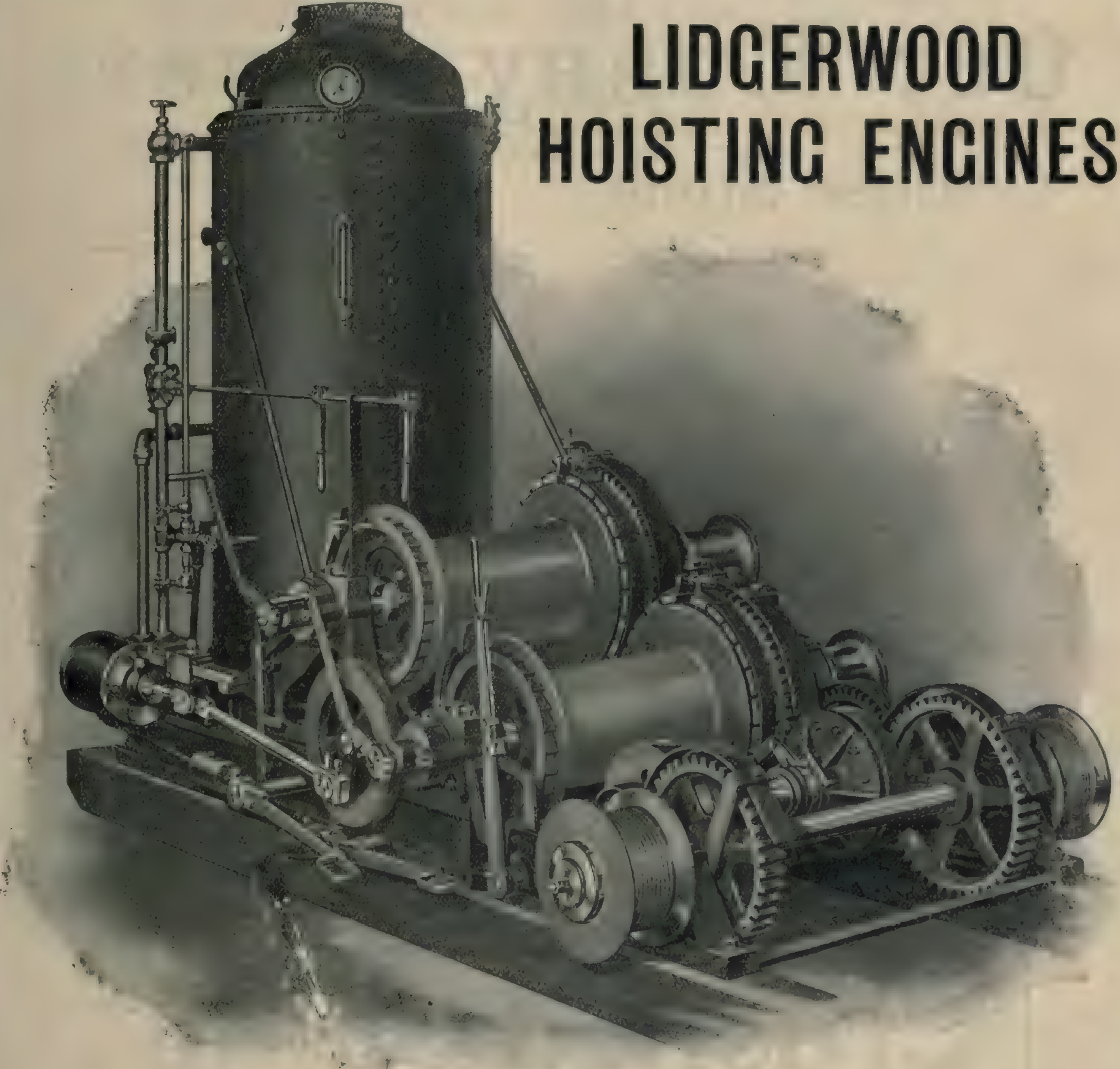

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Banff, Alta.

Tenders addressed to Howard Douglas, Commissioner of Parks, Banff, Alta., will be received up to February 5th for the following sewer pipe and fittings required for extensions to the Banff sewerage system: 282 feet 8-inch sewer pipe; 1,810 feet of 9-inch sewer pipe; 600 feet of 15-inch sewer pipe; 30 6-inch off 15-inch sewer injunctions; 60 6-inch off 9-inch sewer injunctions. The whole of the material to be delivered f.o.b. cars at Banff, on or before the 1st of April, 1909. P. G. Keyes is Secretary, Department of the Interior, Ottawa.

North Vancouver, B. C.

Tenders close January 25th with Alex. Philip, C. M. C., District Council, for the following road machinery: Compound steam 10-ton road roller, with scarifier attached; hand truck for fuel, oil and tool tender for roller; watering cart with distribution pipe and suction hose; travelling van and two traction engines of 4-ton capacity; portable compound toggle knapping motion stone breaker, with screens, elevating and loading machinery; electric motors, with belt and belt attachments for driving the stone breaker, etc.; air compressor of sufficient capacity to supply air for driving three pneumatic 2¼-inch drills. An air receiver of 34 cubic feet capacity, with necessary connections and pipes and three 150-foot lengths of armored ¾-inch hose, suitable for the pressure; three Sullivans or Little Giant Rock, 2¼-inch drills with tripods, weights and complete set of drills each; a Murphy air hammer rock drill, with complete outfit. Sppcifications and instructions to tenderers may be obtained of Donald Cameron, District Engineer.

Sarnia, Ont.

Tenders closed January 11th with H. A. McLean, Town Engineer, for the construction of a vitrified tile sewer on the lane extension of Fleming street, from the main sewer to a point 175 feet west.

Toronto, Ont.

Notice is given that the time for receiving tenders for the supply of asphalt required by the City of Toronto for the year ending December 31st, 1909, has been extended to Tuesday, January 19th.

Tenders close January 15th with Jos. Oliver, Chairman, Board of Control, for the construction of Section No. 3 of the high level intercepting sewer. The work will consist of about 6.385 linear feet of 7-foot 6-inch to 8-foot 6-inch circular sewer, with manholes, connections, etc.

Tenders will be received until January 19th by Jos. Oliver, Chairman, Board of Control, for sewerage construction on Gerrard street, from Carlaw avenue to Pape avenue; Marlborough avenue, from Avenue road to Sidney street; Sidney street, from Marlborough avenue to Cottingham street. Tenders are also invited up to the same date for the supply of 800 feet of rubber fire hose. Specifications may be obtained at office of City Engineer Rust.

The Department of Public Works has under consideration a project for a complete drainage system for the whole of the province of Ontario by the utilization of all rivers and waterways. A government survey and report will probably be made. Hon. Dr. Reaume is Minister of Public Works for Ontario.

Victoria, B.C.

W. J. Dowler, City Clerk, gives notice of the city's intention to construct permanent sidewalks on both sides of Alpha street, from Burnside road to Douglas street, and to drain and macadamize the same, the works to be carried out as local improvements.

Winnipeg, Man.

The city will start work at once upon the construction of a $65,000 sewer.

C. J. Brown, City Clerk, gives notice of the city's intention to carry out various local improvement works, including a 24-foot asphalt pavement on Charles street, from Selkirk avenue to Redwood avenue, at an estimated cost of $19,317.

Plans will be prepared by City Engineer Ruttan for the construction of a trunk sewer for the district west of the Red river and north of the Assiniboine to a point north of the city limits. The question is now under the consideration of the Board of Control.

Railroads, Bridges and Wharves

Bristol, N. B.

The C. P. R. will rebuild their station here at an estimated cost of about $3,000.

Hull, Que.

The Streets Committee will wait upon the Minister of Public Works with a view to securing improvements to the Gatineau bridge.

Ingersoll, Ont.

Application will be made at the next session of the legislature for an act extending the time for building the Tilsonburg, Lake Erie & Pacific from Ingersoll, passing through the counties of Oxford, Perth, Waterloo, Wellington, Dufferin, Grey and Simcoe, to Collingwood.

Kouchibouguac, N. B.

The fine steel bridge at this place was swept away in the recent flood. The Parks, Quigg, Clarendon, Cunningham, Enniskillen and Gaspereaux bridges were also washed away.

Ottawa, Ont.

Incorporation is being sought by the Yellow Head Pass Coal and Railway Company, a mining company, who want to build 100 miles of railway from the Grand Trunk Pacific Railway line in Alberta southeast to the headquarters of the Little Pembina river, and 25 miles from the Grand Trunk Pacific along the Embarras river toward McLeod river.

The C. N. R. are applying for permission to construct a number of new branch lines, amongst which are the following: From a point near Nepigon Bay, northerly to the junction with the National Transcontinental Railway, with two branches to reach water connections at the northerly and southerly ends of Lake Nepigon; from a point on the company's line between Montreal and French River, near the township of Chisholm, northerly and westerly to a point on the Hutton branch in the township of Capreol; from a point on the company's line between Sudbury Junction and Port Arthur, near the source of the Vermillion river, northerly and easterly to a point on the National Transcontinental Railway near its crossing of the Abitibi river; from a point on the line between its starting point and the Great Northern bend of the Montreal river, thence in a generally southerly and easterly direction to a point at or near the south end of Lake Temiskaming. An extension of time for the commencement of the lines of railway authorized by the Canadian Northern is applied for, including the Washago to Kincardine, Arnprior to Gananoque, Pembroke to Cobourg or Port Hope, Township of Pickering to Owen Sound, and Toronto to Windsor lines with a branch from London to St. Thomas and Sarnia, and a branch north of Toronto; Niagara river to Goderich, between Dunnville and Port Dover, to Owen Sound or Meaford; Washago to Midland; Hawkesbury to Toronto; Ottawa line in Leeds or Lanark; Parry Sound to North Bay; French River to Batchewana Bay; Toronto to Ottawa.

Ottawa, Ont.

Quebec, Que.

At a recent meeting of the Council of the Quebec Board of Trade the question of a new and spacious graving dock was discussed. It was decided to confer with the Harbor Commissioners as to the best method of bringing the matter before the government.

Sudbury, Ont.

The survey of the new winter road from the Sudbury district to the Gowganda silver field was commenced by Engineer Stull, of Sudbury, last week. The clearing and constructing of the trail, 42 miles long, will be commenced as soon as the preliminary work is completed. The road will run from the line of the Canadian Northern Ontario Railway in Hutton Township to Gowganda. The construction will be done by the railway, and the provincial government will contribute $2,000 towards the cost. The expense of the undertaking will, it is estimated, be from $100 to $150 a mile.

Toronto, Ont.

The order of the Railway Commission in connection with the projected viaduct provides for a viaduct from York to Cherry street, or from the Union Station to the east end of the city, with overhead bridges in the western portion of the water front. The city will bear one third and the railways two thirds of the cost of the construction of the viaduct.

Vancouver, B. C.
The Great Northern and the Northern Pacific have about completed the purchase of property on False Creek for the new joint terminals. It is sated that the C. P. R. will not begin the proposed enlargement of the depot here this year on account of the large tourist travel anticipated.

Woodstock, Ont.
The Canadian Government has entered into a supplemental agreement regarding the subsidy contract for building a line between Woodstock and Exeter, 45 miles. Theoriginal contract provided for a subsidy at the rate of $3,200 a mile. The act, in which aid for the building of railways is voted, provides that subsidies may be granted at that rate, where the cost of construction does not exceed $15,000 a mile, and may be increased to $6,400 a mile as cost of construction increases.

Public Buildings, Churches, Schools, etc.

Calgary, Alta.
It is stated that negotiations are well under way between the Grand Trunk Pacific and the Canadian Northern, and the Government, for the purchase of the Mounted Police Barracks in this city, which the railway companies intend to convert into a Union Station.

Dauphin, Man.
The public school was destroyed by fire last week at a loss of $12,000.

Edmonton, Alta.
The Public Works Department has ordered the Government to immediately put in fire escapes on the temporary government building in this city.

The Public Hospital Board have taken up the question of financing a modern hospital building, which it is intended to construct next year at an estimated cost of about $100,000.

Halifax, N.S.
S. M. Brookfield, Limited, this city were the successful tenderers for the extension to the Holy Heart Seminary.

Micksburg, Ont.
St. Stephen's Anglican Church was wrecked in an explosion last week. The building cost $6,000. Plans for the reconstruction of the church are under way.

Montreal, Que.
The contract for the new market hall has been let and work will commence in March.

New Westminster, B.C.
Tenders will be called immediately for the erection of the new Provincial Asylum for the Insane to be erected in this city. The central building only will be erected and this portion of the structure will cost about $25,000. The building is part of a scheme to establish a large home which will take about two years to complete and cost approximately two million dollars.

Niagara Falls, Ont.
Tenders are invited until January 18th by C. M. Borter, architect, for the construction of a four room brick and stone school building with slate roof. Plans and specifications may be seen at the office of B. F. Mathews, Chairman, School Board, or at the office of the architect, Woolnough Building, Niagara Falls South.

North Hatley, Que.
Gregoire & Audet, architects, Sherbrooke, Que., are preparing plans for the erection of a new parish church of stone construction to cost $15,000.

Osage, Sask.
Plans are being prepared by A. M. Fraser, of Indian Head, for the erection of a Methodist church in this town, to cost approximately $3,000.

Ottawa, Ont.
A delegation of ratepayers from Ottawa West and Hilson avenue will wait upon the school trustees to urge upon them the necessity of additional school accommodation.

The report of Dr. Hollingsworth, the City Veterinary Inspector, now in course of preparation, contains a strong recommendation in favor of the erection of a public abattoir and it is expected that the whole question will be revived in the City Council.

St. John, N.B.
A wing of the Provincial Hospital at Lancaster was destroyed by fire last week at a loss of over $50,000.

Toronto, Ont.
The Ontario Cabinet met last week to consider plans for the extension of the Parliament Buildings at an estimated cost of $500,000.

Tenders are invited by Symons & Rae, architects, 15 Toronto street, until January 16th for all trades in the erection of a church for the parish of Christ Church, Deer Park.

Plans for the emergency department of the new General Hospital are now under way. It is expected that they will be completed before the close of the winter and that work will be put in hand almost immediately.

Government Post Office Superintendent Ross called on Mayor Oliver and City Engineer Rust last week for the purpose of seeing the approved viaduct plans. These will affect the plans for the new post office at Front and Bay streets, with which the Government intends to go ahead in the near future.

AWARDED.

Ottawa, Ont.
The contract for supplying the builders' hardware for the Y. M. C. A. building has been secured by the Gurney-Tilden Company, of Hamilton, through their local representative, Wm. Graham.

Vancouver, B.C.
The contract for the new Horse Show building has been awarded by the Association to A. E. White and the Franklin Fireproofing Company of Seattle.

Residences

Chester, Ont.
The buildings of S. J. Thompson, Mrs. H. Taylor and J. McLeod were damaged by fire to the extent of about $2,000.

Charlton, Ont.
L. C. Widman is building a boarding house for Mrs. Nixon at an estimated cost of $2,500, also a frame dwelling at a cost of $1,000.

Indian Head, Sask.
Plans are being prepared by A. M. Fraser, of this town, for an addition to the residence of H. G. Wilson, of Indian Head. Stone and wood construction. Estimated cost $2,500.

New Liskeard, Ont.
Geo. Taylor's residence was destroyed by fire last week at a total loss of about $6,000.

Oakville, Ont.
Judge Snider's property on the lake front at this place has been purchased by Mr. Byron E. Walker, who will probably erect a large country house.

Ottawa, Ont.
A vacant house at 42 MacKenzie avenue, owned by the government, was destroyed by fire last week at a loss of $2,000.

An apartment house will be erected on Albert street adjoining the Aylmer apartments by Mr. H. N. Bate, next summer.

Toronto, Ont.
Harton Walker, real estate agent, reports the sale of ten lots of property in North Rosedale to the prospective builders of large family residences.

Vancouver, B. C.
E. S. Mitton, architect, is taking tenders for the erection of an apartment block at Cedar Cottage for Mr. W. H. Fellows.

Recent building permits include: A. Acorn, Woodland drive, four houses, $6,400; P. G. Campbell, Burnaby street, $4,000; D. Salvatore, Napier drive, $1,200; D. McDonald, First avenue, $1,500; Bain and Barker, Salisbury drive, $2,300; Steward Hedete, frame dwelling, Vine street, $4,700; J. J. E. McCague, frame dwelling, York street, $2,400; R. H. H. Alexander, frame dwelling, Gray street, $3,000; F. Marsh, frame dwelling, Keefer street, $1,950; R. W. Beach, frame dwelling, William street, $1,700.

Victoria, B. C.
Permits for dwellings have been issued to W. D. MacGregor, Southgate street, $1,900; A. H. Mitchell, Fernwood road, $2,400; Andrew Cox, Government street, $1,900.

Parfitt Brothers, the local contractors, have undertaken the construction of eight cottages, at a cost of approximately $3,000 each, and the erection of a business establishment, costing about $6,000, the whole work involving upwards of $30,000. To provide sites for the structures, the acre block, formerly owned by W. Snider, Vancouver, which fronts in Fernwood road and is bounded on the north and south by Vining street and Gladstone avenue, has been purchased. Construction will start immediately.

Winnipeg, Man.
Tenders will be received by Herbert B. Rugh, architect, 927 Union Bank Building, until January 16th for alterations and additions to the residence of Mr. W. Moss, 218 Roslin road. We are informed that the estimated cost is approximately $7,000.

Business Buildings and Industrial Plants

Brandon, Man.
Codville & Company's wholesale warehouse was destroyed by fire last week at a loss of $75,000.

Calgary, Alta.
The 75,000 bushel elevator and flour storage of the Western Milling Company were recently burned down at an estimated loss of $80,000, covered by insurance

A 35,000 bushel elevator is to be erected by J. C. Felger.

Campbellton, N.B.
The King Edward Hotel and other buildings were destroyed by fire at a loss of $5,000.

Charlton, Ont.
L. S. Widman is erecting a $2,000 store for Mr. Ford. Mr. Widman states that he is contemplating the erection of several other buildings in the spring.

Kingston, Ont.
The bylaw to bonus the Wormwith Piano Company to the extent of $10,000, which was recently defeated, will probably be submitted again shortly.

Lethbridge, Alta.
The Canadian Bank of Commerce will erect a new building in this city this spring at an estimated cost of $40,000.

Norwich, Ont.
I. J. Rank, whose flour mill was recently destroyed by fire will rebuild at once.

New Hamburg, Ont.
The building of the New Hamburg Manufacturing Company was damaged by fire last week to the extent of about $1,500.

Ottawa, Ont.
A large new office building will be erected on Sparks street by Ahearn & Soper. Plans are now being prepared and construction will commence in the summer.

The Bank of Ottawa will open a new branch office in the property recently acquired near the end of the Elgin street car line. Several alterations will have to be made.

Paris, Ont.
The Sanderson Hardware Company will rebuild their burned-out plant on the present site. It will be double the capacity of the former plant.

Port Essington, B.C.
A destructive fire took place here last week causing an estimated total loss of $100,000. Several business premises, churches, a school, fifteen small cottages and the wharf belonging to the Skeena River Commercial Company were destroyed.

Victoria, B.C.
The Standard Cement Pipe Company will start a plant in this city for the manufacture of concrete pipe.

Rossland, B. C.
The Rossland Engineering Works were badly damaged by fire last week. Estimated loss, $10,000.

Rossburn, Man.
Buildings owned by B. W. Johnstone, A. E. Jones, E. C. Rutherford, R. Wiggins and others, were destroyed by fire on January 5th at an estimated loss of $30,000.

Saskatoon, Sask.
Emerson & Fisher are contemplating a site for the erection of a new branch of the Enterprise Stove Foundry.

St. John's, Nfd.
Tenders closed last week for the erection of three warehouses and the rebuilding of a three store building on Water street for Baird, Gordon & Company.

St. Roch, Que.
A company has been formed for the erection of a large hotel and theatre in this town. The chief promoters are O. Pouliot, G. Proteau, O. Baronet, J. S. Janglais, G. S. Marceau, J. F. Lemieux and F. X. Drolet.

Toronto, Ont.
A permit has been issued to Frank Sharp for the erection of two two-storey brick stores and dwellings on Bloor street west at a cost of $2,300.

Vancouver, B.C.
The Vancouver Milling Company's wheat elevator at False Creek was destroyed by fire last week at heavy loss.

D. A. Smith & Company's furniture store on Granville street was burned down recently at a loss of $80,000.

Whitewood, Sask.
The mill and elevator in this town owned by Jas. Sanders, was destroyed by fire last week.

Wetaskiwin, Alta.
The Copton & Montgomery blocks, together with several stores, were destroyed by fire recently at an approximate loss of $7,000.

AWARDED.

Port Arthur, Ont.
The contract has been let for an immense terminal elevator, which will have a capacity of a million and a half bushels, and will cost nearly $600,000. It will be owned by the Thunder Bay Elevator Company, and will be built by the Barnet-McQueen Company, Fort William.

St. Louis, Que.
The contract for piling required for the foundation of a manufactury to be erected on Elmire, Cadieux and Colonial streets, has been awarded to J. H. Wood & Son, contractors. Joseph Perrault, architect.

Winnipeg, Man.
The Manitoba Iron Works, Limited, have received the contract for all the cast iron columns, amounting to considerably over 200 tons, for the new Eaton buildings and extensions to be erected in the spring.

Power Plants, Electricity and Telephones

Brandon, Man.
A street car service will probably be inaugurated in this city during the present year. A local man has expressed his intention of seeking a franchise for the building of a belt line system.

Brantford, Ont.
The City Council has passed a bylaw allowing the Brantford Street Railway an extension of time in which to fulfil its former agreement with the city, its franchise, granted a year ago, to be sustained on condition that the agreements stated in the previous bylaw and somewhat amended be carried out. The company is to give the city, within two months, a bond for $25,000 as a guarantee that the agreement will be adhered to.

Fernie, B. C.
Tenders are invited by G. H. Boulton, City Treasurer, until January 22nd for the purchase of $50,000 five per cent. 20-year electric light debentures.

Hamilton, Ont.
The construction of the Hamilton, Waterloo and Guelph Electric Railway will be proceeded with at the earliest possible date. The right of way from Rockton to Galt is about completed and it is expected that the whole right of way will be settled in about two months.

Lethbridge, Alta.
Engineer Arnold, of Toronto, has been appointed to interview Smith, Kerry & Chace in regard to the new power plant as the estimates submitted by Smith, Kerry & Chace are $57,000 in excess of the amount provided by the bylaw.

Moncton, N. B.
The city will apply for legislation to authorize them to construct and operate an electric street railway in Moncton, and in the parishes of Moncton and Shediac.

Montreal, Que.
The Saraguay Electric & Water Company, of which Chas. Brandeis, C. E., of Montreal, is engineer, are calling for tenders for transmission line, extending from the power house to Point aux Trembles, a distance of about 17 miles. The work will be commenced early this spring.

Niagara Falls, Ont.
McKenzie & Mann interests are about to begin the development of their right of way for a railway between Niagara Falls and Toronto, and have also begun preliminary work on a bridge across the Niagara river. Engineers have begun work surveying on the American side of the river for the approach of the bridge, which will cross the river just north of Niagara street. Mackenzie & Mann interests now own a right of way for a power transmission line, and the land secured is sufficiently wide to permit the construction of a double track railway from Toronto to this city. The engineers state that the work of preparing the plans will be hurried through, and it is thought that the work of construction will begin early in the spring. From Mr. Thomas Penny, President of the International Street Railway Company, it is learned that this work is the beginning of the trans-Niagara bridge project, and that it is in no way connected with the International Street Railway.

Ormstown, Que.
In a recent fire at Walsh's Mills the local electric light plant was destroyed and the town left without lighting.

Sydney, N. S.
The Sydney-East Bay Electric Railway will make application to the County for several concessions for the construction of their proposed road.

St. Lambert, Que.
The Town Council has passed the bylaw granting a franchise to the Montreal & Southern Counties Railway through St. Lambert across the Victoria bridge and into the city of Montreal, making its terminus at the foot of McGill street. The bylaw will be submitted to the citizens on January 14th.

Toronto, Ont.
Hon. Adam Beck was recently in the city and stated that the extension of the contract with Mr. F. H. McGuigan will be at once considered and a new line from London to Windsor probably determined upon. The present plans call for 293 miles and the extension would be 128 miles, a total of 421 miles.

Vancouver, B. C.
James D. Schuyler, Union Trust Building, Los Angeles, has advised the British Columbia Electric Railway Company to undertake at the mouth of Lake Coquitlam the construction of a dam 75 feet high. This will create an increased supply, which will flow through the hydraulic tunnel to Lake Buntzen, there being delivered to the pipes which carry it to the generating station on the North Arm of the inlet. This scheme is being laid before the pro-

vincial government. R. H. Sperling, Vancouver, is general manager.

Winnipeg, Man.

Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until January 20th for supply of fifty luminous or magnetite arc lamps with necessary station regulating apparatus for controlling same. Specifications and forms of tender may be obtained at the office of the City Electrician.

AWARDED.

Winnipeg, Man.

Following are particulars of the recommendation of the board of consulting engineers to the City Council in connection with the power plant: For doing the general works the engineers recommend the tender of John Gunn & Sons, Winnipeg, the contract price to be $779,100. The tender accepted is the second lowest. The lowest was that of William Newman & Company. The engineers recommend that the tender of the power construction department of the city be accepted for the transmission system erection. The price bid is $89,680, or over $30,000 lower than the next lowest tender. The board recommend that the tender of the Northern Aluminum Company, for the supplying of an aluminum cable at $148,050, be accepted. A copper cable would, they report, cost $219,710. For the supplying of the necessary steel towers, the engineers favor the tender of the Manitoba Iron Works, Winnipeg, at $3.90 per one hundred pounds, the tender being the lowest. The following are the figures in detail: For general works. — William Newman, $771,850; Haney, Quinlan & Robertson, $785,150; Power Construction Department, $816,806; Thomas Kelly & Sons, $883,679; Hydraulic Contracting Company, $905,444. For transmission system erection:—Power Construction Department, $89,680; Thomas Kelly & Sons, $111,435; R. McManus & Company, $182,892. For transmission cable: Northern Aluminum Company, aluminum cable, $148,050; Thomas Kelly & Sons, aluminum cable, $157,500; Eugene Phillips, copper cable, $219,710; Dominion Wire Manufacturing Company, copper cable, $222,250. For steel towers: — Manitoba Iron Works at 3.90 per pound, being the lowest tender. The City Council subsequently awarded tenders in accordance with the above recommendations.

Miscellaneous

Montreal, Que.

Tenders may be submitted to L. O. David, City Clerk, until January 15th for the supply of fire hose, salvage covers, two hook and ladder trucks and two extension ladders of 55 feet. Full information obtainable at office of Chief of the Fire Department, City Hall.

Nokomis, Sask.

Tenders addressed to W. A. Armour, Secretary-Treasurer, will be received until February 1st for $10,000 six per cent. 20-year town improvement debentures.

NEW COMPANIES.

Tomiko Mills Limited, Tomiko, Ont., lumber manufacturers, incorporated, capital $75,000. Incorporators, E. J. Buckham and A. S. Duff, Tomiko, Ont.; W. Anderson, Ottawa, Ont.; G. B. Ferguson, Renfrew, Ont., and J. J. McFadden, Toronto, Ont.

Berlin Central Heating Company, Limited, Berlin, Ont., incorporated, capital $80,000. Incorporators, J. D. Moore, P. S. Lautenschlager, A. Bricker, J. M. Schneider and C. H. Doerr, all of Berlin, Ont.

Electric Railway Supplies, Limited, Toronto, Ont., incorporated, capital $40,000. Incorporators, S. Johnston, W. N. Tilley, A. J. Thomson and R. H. Parmenter, all of Toronto.

Barton & Binbrook Telephone Company, Limited, Hannon, Ont., incorporated, capital $10,000. Incorporators, T. E. Tidy, Barton Township, Ont., H. Johnson and N. Laidman, Binbrook Township, Ont., and others.

W. D. Morris, Limited, Ottawa, Ont., incorporated to deal in lumber, brick, sand and other building materials, etc., capital $150,000. Incorporators, W. D. Morris, G. B. Acheson, R. G. Code and others, all of Ottawa.

Oliphant Oil & Gas Company, Limited, Listowel, Ont., incorporated, capital, $22,500. Incorporators, T. J. Walsh, of Amabel Township, Ont., J. H. McCorkindale, of Owen Sound; J. C. Hamilton and E. Gabel, Listowel, Ont., and others.

Clinton Fireproofing Company of Canada, Limited, Montreal, Que., incorporated, capital $30,000. Incorporators, F. L. Gagnon, E. R. Gagnon, W. B. Reddy, and J. F. Reddy, all of Montreal, Que., and S. Golliek, of New Jersey, N. J.

Midfield Natural Gas Company, Hamilton, Ont., incorporated, capital $40,000. Incorporators, A. S. Devine, C. C. Foote, M. H. Little, W. Anderson and W. B. Anderson, all of Hamilton.

Canadian Road Machine Company, Limited, Hamilton, Ont., capital $60,000. Incorporators, R. Mancill, C. Walters and W. Bell, all of Hamilton, Ont., and S. J. Phillips and W. Voorhees, both of Kennett Square, Pa.

Canadian Railway Equipment Company, Limited, Toronto, Ont., incorporated, capital $200,000. Incorporators, A. W. Holmestead, F. H. Potts, A. R. Bickerstaff, T. A. Silverthorn, and others, all of Toronto.

Canadian Crown Castings Company, Limited, Montreal, Que., incorporated, capital $199,000. Incorporators, F. M. Gibson, M. M. Tinsley, G. L. Gillon, all of New York, N. Y., and A. Collyer and C. C. Cousins, both of Montreal, Que.

Modern Agency Supply & Construction Company, of Ottawa, Limited, Ottawa, Ont., incorporated, capital $10,000. Incorporators, F. X. Talbot, R. Belanger, C. Perron, E. J. Labelle and others, of Ottawa.

Westmount Plumbing & Heating Company, Westmount, Que., incorporated, capital, $90,000. Incorporators, W. A. Rousseau, J. Giguere, M. A. Cardinal, J. J. Meagher and J. E. Coulin, all of Montreal.

Dougall Varnish Company, Limited, Montreal, Que., incorporated, capital $150,000. Incorporators, J. S. Dougall, J. H. Dougall, W. A. McGuinness, G. Bylling and J. E. Coulin, all of Montreal.

Canadian Montauk, Limited, Montreal, Que., incorporated to manufacture thermostatic detecting devices, etc., also to carry on the business of electricians, mechanical engineers, and workers and dealers in electricity, motive power, heat and light, etc. Capital $250,000. Incorporators, S. A. Jacobs, Montreal, Que.; J. D. Gould, New York, N.Y.; D. Burnside, E. R. Rognon, W. C. Towers and others, of Montreal.

O. Charlifoux & Son, Limited, St. Hyacinthe, Que., incorporated to manufacture agricultural and logging machinery and implements, capital $100,000. Incorporators, H. T. Chalifoux, P. T. Chalifoux, A. Sauve, all of St. Hyacinthe; H. J. Chalifoux and J. L. Chalifoux, both of Montreal.

St. Maurice River Boom & Driving Company, Limited, Three Rivers, Que., incorporated, capital $25,000. Incorporators, R. F. Grant, J. M. Dalton, A. Baptiste and V. Burrill, all of Three Rivers, Que., and others.

Canadian Light, Heat and Power Company, Montreal, Que., incorporated, capital $200,000. Incorporators, R. Locke, Westmount, Que.; R. Lacroix, H. L. Auger, M. Dufresne and R. Lanthier, Montreal, Que.

Labrador Pulp & Paper Company, Montreal, Que., incorporated, capital $1,500,000. Incorporators, E. Hutcheson, J. A. Richards and B. Stephens, all of Montreal, Que., and R. Smith and E. H. Weatherall, both of Westmount, Que.

WESTERN RAILWAY DEVELOPMENT.

President Wm. Mackenzie and Vice-President D. D. Mann, of the Canadian Northern Railway, have been in Winnipeg conferring with the heads of departments with regard to estimates and proposed extensions on the western section this year. Premier Scott of Saskatchewan and Premier Rutherford of Alberta, met Messrs. Mackenzie and Mann by appointment at Winnipeg, but no information in regard to the subject in conference was given out. The Grand Trunk Pacific Railway Company have announced that they will inaugurate a new scheme of colonization this year in order to get lands in the vicinity of their line occupied and settled as rapidly as possible. Details are now being completed by A. E. Duff of the company's office at Winnipeg.

BUSINESS NOTES.

Strang & Slade, carpenters, Montreal, Que., have registered.

E. I. White & Son, lumber dealers, Oxford, N. S., have discontinued business.

Keeling & Company, electricians, Ottawa, Ont., have assigned to F. X. Laderoute.

H. J. Thompson, McKellar, Ont., is seeking a purchaser for his saw mill business in that town.

The D. Wilkie Granite Company, London, Ont., has been succeeded by Wilkie, Jones & Company.

Applications for the position of city engineer of Calgary, Alta., close January 20th with H. E. Gillis, City Clerk.

F. X. Bilodeau has been appointed curator in the affairs of A. Bouchard & Company, carpentry contractors, Montreal, Que.

Hutchison & Wood, architects, Montreal, Que., have dissolved partnership and have been succeeded by Hutchison, Wood and Miller.

The assets of the Stratford Brick Tile and Lumber Company, Limited, will be sold by auction at Stratford, Ont., on January 15th.

A winding up order has been given in connection with the National Construction Company, Limited, Vancouver, B. C., and M. J. Crehan has been appointed provisional liquidator.

T. A. Moore & Company, contractors, Montreal, Que., have dissolved partnership.

V. E. Paradis has been appointed curator in re E. Forcier, lumber manufacturer, St. Pierre, Que.

Tenders and For Sale Department

Agent Wanted

or the best line of Concrete Machinery in the world. A splendid opportunity for an aggressive young firm or individual. Box 136, CONTRACT RECORD, Toronto. tf

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City Engineer Wanted

Applications will be received by the Commissions of the City of Calgary for the position of City Engineer for said City, up to and including JANUARY 20TH, 1909.

Applicants are to furnish references and state experience respecting Sewers, Water Works, Street Paving and Concrete Sidewalks, etc.

Applicants to state salary required.

Services to commence on February 15th or before it possible.

H. E. GILLIS,
City Clerk. 2

Tenders

for Supply of

Turbine Pumping Machinery

Sealed tenders addressed to the Chairman, Board of Control, Winnipeg, for the supply and erection of turbine pump, with electric motor for the City Water Works will be received at the office of the undersigned up to 11 a.m. on MONDAY, FEBRUARY 22ND, 1909. Specifications and forms of tender together with conditions governing tender as prescribed by the City By-laws may be obtained at the office of H. N. Ruttan, City Engineer, Winnipeg. The City reserves the right to reject any or all tenders or to accept any bid which appears advantageous to the City of Winnipeg.

M. PETERSON,
Secretary.

Board of Control Office,
Winnipeg, Nov. 25th, 1908. 51-2

City of Regina

Tenders for Regina General Hospital

The undersigned will receive sealed tenders on behalf of the Corporation of the City o Regina, marked "Tender for Regina General Hospital" up till five o'clock p.m., on MONDAY, 1ST FEBRUARY, 1909, for the construction of the new Regina General Hospital, according to plans and specifications prepared by Meyer J. Sturm, Architect, 84 La Salle St., Chicago, U.S.A., which may be seen at the office of the City Clerk, Regina, as well as at the Builders' Exchange, Winnipeg.

Each tender to be accompanied by a certified cheque drawn upon any chartered bank of Canada payable to the order of the "City of Regina" to the extent of $5,000.00, which will be forfeited should the contractor fail to enter into a satisfactory contract when notified to do so, and which will be returned to the unsuccessful bidders when the contract is signed.

The contractor whose tender is accepted will be required to furnish a bond for $25,000.00 by a Canadian or British Guarantee Company.

The City Council reserve the right to reject any or all tenders, and to waive any defects or irregularities therein.

A deposit of $10.00 must accompany any application to remove plans snd specifications from the City Clerk's office and such privilege will only be granted to bona fide contractors for the entire work.

J. KELSO HUNTER,
City Clerk.
Regina, Sask., 28th December, 1908. 4

Tenders for Bridge

Tenders will be received by the undersigned up to 12 o'clock noon, on TUESDAY, THE 26TH DAY OF JANUARY, 1909, for the erection of a Steel Bridge over the Saugeen River at a point about 2½ miles East of Port Elgin. Bridge is about 300 feet long. Cement pier in centre to be built, the abutments are nowerected. Plans may be seen at office of County Clerk at Walkerton, or tenderers may submit their own plans and specifications. Deposit of ten per cent. to accompany each tender which will be returned it tender not accepted. The lowest or any tender not necessarily accepted.

Dated this 29th day of December, 1909,

P. A. MALCOMSON,
4 County Clerk, Walkerton, Ont,

City of Kingston

TENDERS

Sealed tenders addressed to the undersigned will be received until THURSDAY NOON, JANUARY 28TH INST. for the following materials:

CEMENT

5,000 bbls. more or less Portland Cement.

SEWER PIPE

Specifications and other information may be obtained on application, and copies of the specifications are on file in the office of the CONTRACT RECORD, Confederation Life Building, Toronto.

H. B. R. CRAIG,
City Engineer.
January 11th, 1909. 2

A Far-Fetched Legal Decision

The English laws are far more severe than the American in granting protection to workmen. As a result serious accidents in manufacturing and building operations are not as frequent on the other side of the Atlantic as on this. Sometimes, however, it may be felt that the English courts go rather too far. A recent case in London illustrates this fact. A contractor who was engaged in paving near the Albert Hall entered into a sub-contract for carting the rubbish. Where it was to be deposited was not stated. The sub-contractor's son while driving slipped and fell from the cart. The wheel passed over his neck and he died. He was then two miles from the Albert Hall. When a claim was made under the Workmen's Compensation Act the County Court judge ordered that both the principal and the sub-contractor should pay compensation. The principal appealed the case. The Court of Appeals reversed the decision, not on account of any injustice in the claim itself, but only because it was held that the scene of death was too far from the Albert Hall to be considered as "at, in, or about the place of employment," which is the language of the Workmen's Compensation Act.

Care in Bonding Concrete.

The "Engineering Record" sums up the whole question of the difficulty in securing a good bond between fresh concrete and old by saying that the real obstacle is dirt. This may be an oily substance, or a finely comminuted material that forms an inert layer, or any substance that prevents the new crystals from attaching themselves continuously to those already formed. New concrete can be bonded to old, if the surface of the old material is thoroughly cleaned — not wiped off or dabbed at with a wire brush and then dashed with not overclean water. Intelligent manipulation and the exertion of some pressure are necessary to secure the best results. Be sure, first of all, that the old concrete is clean—and thoroughly clean.

The approximate breadth of a river, or other stream, may be determined by means of the brim of a hat or the peak of a cap, and can be done by a boy as well as by a man. The person desiring to ascertain this fact must place himself at the edge of the bank of the river and lower the brim of his hat, or peak of his cap, till he finds the edge just cuts the other bank; then after placing the hand under the chin, he must turn round steadily till he faces some level ground on his own side of the river, and observe when the edge of the peak again meets the ground. The measure of this distance will be very nearly the breadth of the river.

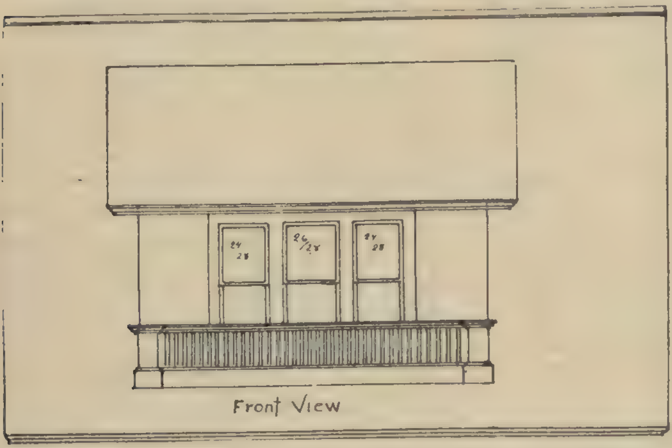
"The bungalow of to-day," says the "Tatler," "is a very luxurious affair. Except that all the rooms are kept on one floor, it is quite as substantial as the average country cottage or house, and, even in the matter of rooms on one level, many bungalows have now one or two bedrooms on an upper floor. In fact, the modern bungalow is distinguished from the average house more by the studied rusticity of appearance, which consorts admirably with its surroundings, than by any material difference in its accommodations. And, added to other advantages, it is remarkably cheap."

Construction of Dormer Windows.

In building dormers it is like building a house, everybody wants to get the best for the least money; an ugly looking dormer will spoil the appearance of a fine house, while a neat and well-designed dormer will improve the looks of almost any house.

In this number we show the construction and cost of the "shed roof" type of dormer window.

The shed roof feature makes it easy of construction, particularly the framing, sheathing and shingling, and materially reduces the cost in this part of the work. Then again it is a very convenient form to put into an old house where it is desired to build a room up in some attic. By putting in two or three windows as shown and making the frame broad, a good square room can be obtained in almost any attic. The frame work of the window should be whatever the width of the room is it is desired to make, and the height of the dormer should be the proper height to get a square ceiling to the room.



Front View

The estimated cost, in detail, of this dormer is as follows:

10 2x4x18; 16 2x2x14; 6 2x4x12=408 ft. at $25.	$10.20
400 feet No. 2 Y P sheathing, $25	10.00
2000 shingles, $3.50	7.00
250 feet ½ by 4-inch siding, $30	7.50
50 feet 4-inch crown mold, 2c.	1.00
48 feet 2-inch bed mold, 1c.	48
2 balcony newels, $1.50	3.00
20 feet balcony rail, 6c.	1.20
80 balusters, 1⅛ by 1⅛ by 18 inches, 3c.	2.40
20 feet base, 5c.	1.00
200 feet ⅝ by 4-inch by 16 feet for ceiling, 3c.	6.00
60 lineal feet 1 by 4-inch fir finish	.75
1 triple window frame	6.00
2 window frames, 24 by 28, 2 lt., $.160	3.20
1 window, 26 by 28, 2 lt.	1.65
10 feet window stool, 2c.	.20
10 feet window apron, 2c.	.20
24 feet window casing, 2c.	.48
10 feet head casing, 2c.	.20
10 feet cap mold, 2c.	.20
10 feet fillet, 1c.	.10
42 feet window stops, 1c.	.42
84 flashing tins, 1½c.	1.26
90 square feet tin, balcony floor	9.00
Sash cord weights and sashlocks	2.50
Carpenter work, 40 hours at 40c.	16.00
Plastering sides and ceiling	9.00
Cost of painting	7.00
Total estimated cost	$107.94

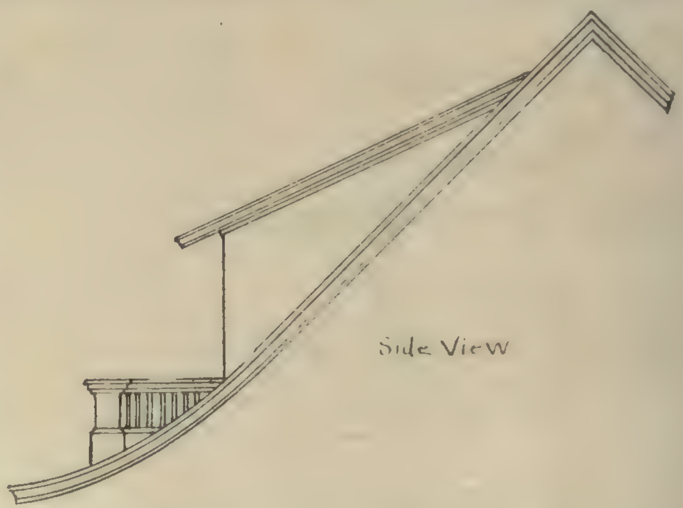
Thus we see that the estimated cost of this dormer runs up to $107.94; and there is no margin added for incidentals. Nothing is figured for a floor in the room, because the floor is supposed to be there in the average building, but if a floor had to be put in it would be necessary to figure it. No nails were figured either, which goes to show very plainly that a dormer window of this kind and size is worth anywhere from $108 to $125, according to the general conditions likely to be met with in this kind of work. The figures given in this article include finishing up the dormer, but not the entire room that might be built back of the dormer and for which it is to furnish light.—T. P. Hicks, in the "American Carpenter and Builder."

C. H. Mitchell Forms Partnership with Brother.

Mr. C. H. Mitchell announces that he has now in partnership with him his brother, Mr. P. H. Mitchell, with offices as before, in the Traders' Bank Building, Toronto. Mr. Charles Mitchell is well known as an hydraulic engineer, having been connected during the past fifteen years with numerous hydro-electric works, notably the Ontario Power Company, of Niagara Falls. He has been practising as a consulting engineer in Toronto for the past two years. Mr. Percival Mitchell, who is a graduate of Toronto University, 1903, has had considerable experience in mechanical and electrical engineering, obtained with several electrical manufacturing concerns, as well as with the Ontario Power Company and the city of Winnipeg, in its hydro-electric power plant. He has been engaged in practice in Toronto during the past few months, having taken over the work of Mr. K. L. Aitken, who was recently appointed City Electrical Engineer of Toronto. Messrs. Mitchell, as consulting and supervising engineers, will devote their attention especially to hydraulic, steam and electric power developments, mechanical and electrical equipments for industrial works, and municipal sewerage, waterworks and electric lighting.

A Prosperous Clay Working Plant.

An example of the progressiveness of the Maritime Provinces is furnished by the Middleton Clay-working Company, Middleton, N.S., managed by Mr. L. E. Shaw. The total output of brick for the past year was 1,200,000, all of which will be disposed of before new ones are ready for market. Sales were slow during midsummer, but the fall trade was excellent. A new upper draught kiln was installed last spring, at a cost of $1,500, which is a great labor saver and gives a more uniform product. The making of brick will be resumed in the spring, as soon as the weather will permit.


Side View

ESTABLISHED 1886

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Vol. 23 Toronto, January 13, 1909 No. 2

One Good Result of Depression.

Most people say that the recent financial depression was *the* ill wind that blew nobody any good. It is a matter of opinion whether the labor market of to-day does not offer a direct contradiction to such a sentiment. It is no severe tax upon the memory to recall the fact that prior to this slump Canada enjoyed a period of steady progression extending over nearly ten years. Everything was on the upward trend. Records of building and construction, of bank clearings, of exports and immigration, of imported capital and so forth that were a nine days' wonder in the latter "nineties" lost all significance in the added ciphers of the twentieth century. The magical growth of the western cities in recent years is too familiar for citation. It will make an interesting fairy tale for the youth of the third generation. Such was the period that came before the depression and for such an era of unprecedented favor every loyal Canadian should entertain the devoutest gratitude.

In perfectly logical order, however, there came certain complications in labor. Unskilled laborers, a couple of years ago, were hesitating to take work at the price of moderately skilled labor. Wages and salaries were paid, wholly out of keeping with the quality of the work done or the responsibilities borne. Such a condition was unnatural and undesirable, since it reduced the incentive for good endeavor which is so desirable as an uplifting force in a community.

Employers of labor generally, and the building and contracting fraternity in particular, cannot but feel thankful that this condition has now passed. Nineteen hundred and nine may be hailed as a year of all-round reform. Men will be selected for positions strictly on the basis of their ability to perform the duties of these places. It will be necessary for employers to exercise far more care in selecting their forces and for employees to show, as a rule, greater interest in the work they are doing.

From this state of affairs better conditions must inevitably result, not only for the employer but also for the employee; for it is axiomatic that the call of competition for added interest and renewed effort is productive of the best workman.

Trade Confidence Well Restored.

That the year 1908 has laid a good foundation for expansion of business during 1909 is well shown by the editorial review in the January 2nd issue of Bradstreet's. Speaking of conditions in Canada this publication says among other things: "Financially, the year saw a gradual change from aggravated stringency to a condition in which money offers freely for all purposes. The banks, which a year ago were calling in their loans, have now more money than they can find use for. Both circulation and deposits have largely increased, and monetary conditions are in a much sounder condition than they were at the beginning of 1908.

"The fact that the last two or three months of the year have shown a general broadening of trade activity is good reason for believing that 1909 will see a return to more prosperous conditions generally. It may be said that prospects are everywhere at the best. Owing to favorable weather an unusually large amount of fall plowing has been done in the West, and a very considerable increase in grain acreage is indicated for next season.

"The work of railway extension went forward with rapid strides in all directions; indeed the year is remarkable for what has been done in this connection. The new Grand Trunk Pacific was pushed forward with all possible speed. The line from Winnipeg to Edmonton is now about completed, and this new road helped somewhat toward the moving of the crop. The Canadian Pacific Railroad very largely increased its mileage; the Canadian Northern was busy extending its tracks both in the West and in eastern Canada, and the Grand Trunk spent much money upon existing roadbed and extensions. In this regard the year provided an asset of inestimable value for the country's future."

Referring to conditions generally throughout North America, Bradstreet's says: "All things considered, the country really is in far better shape than a year ago, and this gain in optimistic sentiment, with the knowledge that we have been partially spared one of the worest effects of previous great panics, long continued and acute depression, with the consequent sacrifice of business life and slaughter of capital in the shape of commercitl failures—is in itself a great gain for trade confidence. There is a sense of deep relief that the community has passed so safely through a great crisis, and it is with a feeling of chastened and yet cheerful conservatism that the business world looks forward to the year 1909 with a fair degree of confidence, but with little expectation of a boom."

The coming season should be a period of better and greater diversity of materials used in construction. For several seasons past, there has been a uniformity of construction to the exclusion of some of the other materials, and the manufacturers and dealers in the goods slighted have felt the effect considerably. But some lines at least propose to push their product by a greater line of publicity to the general public, a course which will doubtless have an excellent effect, if carried out judiciously. This action will probably be met by some of the producers of other materials taking a similar action, and the net effect will be a more general distribution of the different materials, and consequently a better variety of construction than has been the case in the past. This will be of general good and should be appreciated by all, except those whose goods are affected adversely by the change. And it will become the usual law of competition, the matter of convincing the owner of the merits of the goods, but with the difference of possibly a greater consideration of the different materials. Human nature is incapable of thinking uniformly upon any subject, so there is and should be room for all materials to have a share in the business available, and afford a profit for the producers and dealers.

Builders' Exchange Made Merry.

The president and directors of the Montreal Builders' Exchange gave a New Year's at home at the rooms of the exchange in the Mechanics' Institute. More than 200 guests attended. The visitors were received by Mr. Thomas Ford, the president; Mr. J. N. Arcand, vice-president, and Messrs. Alex. Bremner, W. E. Ramsay and J. T. Castle, directors, and Mr. J. H. Lauer, secretary. There were also present Messrs. George Hood and N. J. T. Gagnon, past presidents, and Mr. James Simpson, who was the first president of the association at its formation. Refreshments were served and the affairs of the exchange discussed, satisfaction being expressed at the growing membership and sound standing. Although the building trade had suffered somewhat from depression during the past year, the members were optimistic regarding prospects during the new year. The informal discussion also touched upon the necessity of builders safeguarding their legislative and industrial interests during the year. On May 1st the exchange will move into more commodious and up-to-date quarters in the new Eastern Townships Bank building, and a feature following the change will be a permanent exhibition of all the materials used in building work under one roof. It was the decided opinion of those present at the function that this would be of great benefit to those interested in the building and contracting trades. Satisfaction was also expressed at the introduction of a uniform form of contract.

Cement Exhibition Arrangements.

Arrangements are progressing favorably for the first annual convention of the Canadian Cement & Concrete Association, which is to be held at Toronto from March 1st to 6th. The prospects are that every space will be taken up and that about one-third of the exhibitors will be representatives of United States firms.

It is expected that the programme will include at least fifteen papers to be read by men of special experience along the various lines of concrete and cement work. At least three of the papers will be by Montreal men and two by Toronto men. The subjects dealt with will vary from the manufacture of cement to its numerous uses, such as sidewalk construction, bridge building, block and brick making, reinforced concrete work, etc. Among the visitors to the convention will be some of the most prominent specialists in the United States. It is expected that at least three of the papers to be read will be upon matters relating to reinforced concrete.

Following is a list of the exhibitors who have already taken space:

Peerless Brick Machine Co., Minneapolis; Thorn Cement Co., Toronto; Wadsworth, Howland & Co., Boston, Mass.; Sun Portland Cement Co., Owen Sound, Ont.; F. M. Jackson, Akron, N.Y.; Oneida Community Co., Oneida, N.Y.; Concrete Engineering & Construction Co., Toronto; Multiplex Concrete Machinery Co., Toledo, O.; Mussens Limited, Toronto; London Concrete Machinery Co., London, Ont.; Trussed Concrete Steel Co., Toronto, Ont.; Industrial Chemical Co., Swansea, Ont.; Roman Stone Co., Toronto, Ont.; Canadian Art Stone Co., Toronto, Ont.; Ideal Concrete Machinery Co., London, Ont.; United States Steel Product Export Co., Buffalo, N.Y.; Koehring Machine Co., Milwaukee, Wis.; Brantford Roofing Co., Brantford, Ont.; Expanded Metal Co., Toronto, Ont.; National Portland Cement Co., Durham, Ont.; Morssen & Co., Montreal, Que.; Cement Tile Machinery Co., Waterloo, Iowa; Montreal Rolling Mills Co., Montreal, Que.; W. D. Beath & Co., Toronto, Ont.; Gould, Shapely & Muir Co., Brantford, Ont.; Canadian Portland Cement Co., Toronto, Ont.; Senator Mill Mfg. Co., Galt, Ont.; Marblecrete Products Co., Akron, N.Y.; United States Gypsum Co., Chicago, Ill.; Stinson Reid Co., Montreal, Que.; R. Z. Snell Mfg. Co., South Bend, Ind.; Galt Art Metal Co., Galt, Ont.; Wettlaufer Bros., Mitchell, Ont.; Canadian Ornamental Iron Co., Toronto.

A Well-Known Engineer's Death.

Mr. George H. Middleton, C.E., who died in Edinburgh, Scotland, recently, is well remembered in the engineering profession in the Dominion, as well as in South Africa. While at St. Andrew's University, Scotland, he was a classmate of Lord Aberdeen, and after studying engineering in the office of Mr. John Lang, of Kircaldy, he came to Nova Scotia in 1870. He was first engaged in surveying various large properties around the North-west Arm of Halifax. In 1871 he entered on construction work in the St. Lawrence district of the Intercolonial Railway; afterwards he was transferred to the Canadian Pacific Railway, and was placed in charge of the heavy and difficult work around the north shore of Lake Superior. On its completion, he entered into partnership with the late Sir Robert G. Reid in connection with the establishment of the Newfoundland Railway. Severing his connection with that undertaking he went to Natal, and was then engaged in extensive railway works. He continued in that field throughout the South African War, and completing his engagements in the most satisfactory manner, he returned to Scotland.

Mr. Middleton was a man of the greatest activity and earnestness. He was characterized by the highest integrity, and was respected by all who knew him. He married in Canada a daughter of the late Samuel Hazelwood, district engineer of the Intercolonial Railway. He leaves a widow and four sons. The eldest son is at present on the engineering staff of the C. P. R. at Lethbridge.

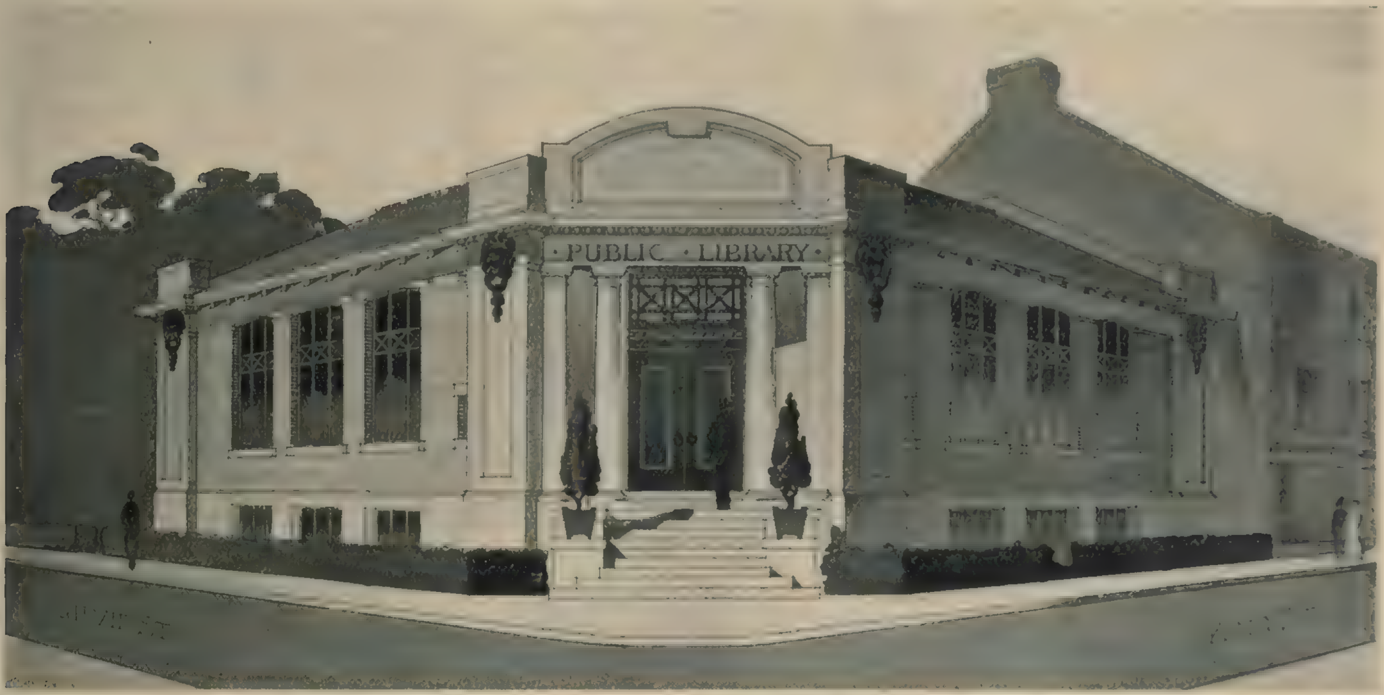
Death of William Burrow.

The death occurred recently of Mr. William Burrow, of Hamilton, Ont. In 1864, in company with Charles Stewart and John Milne, he established the firm of Burrow, Stewart & Milne, with which he was identified until the time of his death. For about six years the firm devoted its energies to contract work, and in 1870 went into the manufacture of builders' hardware, and subsequently took up the manufacture of stoves and ranges. Shortly afterwards the firm branched out still further, when it undertook the manufacture of hot air furnaces and all types of weigh scales.

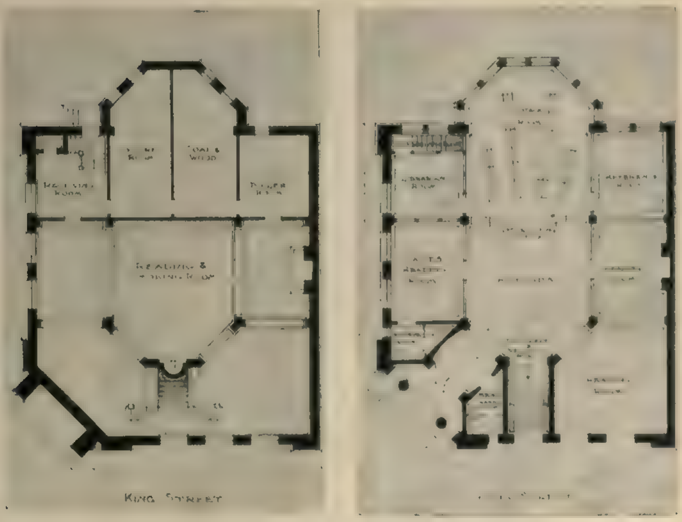
To attain full strength in a brick pier the quality of the mortar must be considered. Strength is sacrificed by the use of a lean mortar, and lime mortar in particular is to be avoided when strong work is desired.

A New Public Library Building.

The new public library at Dundas, Ont., which is illustrated herewith, and which is now being constructed, shows an attractive and simple treatment for this class of building. The foundations are of cement covered with blanc cement stucco. The trimmings are in block cement and Roman stone. The walls are white brick, and metal window frames have been used. The building contains two floors, one in the basement and one slightly above the ground. The ground floor plan, as illustrated, shows that the distributing space faces a large hall into which one enters from the porch. Behind the distributing space is the stack room, on either side of which are the reference room and the librarian's room. Two reading rooms, a ladies' reading room and lavatories are provided on the ground floor. The basement contains a large reading and smoking room together with boiler room, receiving room, store room, etc. The architects for the building are Messrs. Chapman & McGiffin. 59 Yonge street, Toronto.



New Public Library at Dnndas, Ont.—Chapman & McGiffin, Architects.



Floor Plans of Dundas Public Library.

To Remove Smoke Stains from Brick.

A new compound for cleaning smoke stains from brick fronts has recently come into general notice. After a fire in a building, the brick work is often badly discolored about the doors and windows with smoke and gases, and the removing of this during reconstruction of the building has always been a laborious task and usually accomplished with the liberal use of sand and water and a wire brush. The new compound is composed of one gallon soft soap, not too much water, to which add two pounds of powdered pumice, double 00, or F, and one pint of liquid ammonia. The ordinary, sold as household, ammonia, will answer, though it will be more effective if a little stronger ammonia is used. First remove as much of the soot as possible with a stiff broom or fibre brush, then apply the soap and ammonia mixture with an ordinary fibre brush or common whitewash brush and let it remain on for about 20 to 30 minutes. Then use a good scrubbing brush, rubbing it over the surface briskly, dipping it often in clear water, finally rinse the surface with clean water and a large carriage sponge, or, if convenient, use a hose with a spray nozzle for rinsing. This is said to remove the most stubborn case of stains from fire and smoke.

By the time all the claims are in for damage to property through the proposed Lombard street bridge at Winnipeg they will apparently foot up to well over $500,000. The figures have now climbed up to nearly $400,000.

Among the products of the Province of Nova Scotia for the year 1908, the statistics show that the gypsum, limestone and other materials produced amounted in value to $725,000. Stone and building material were produced to the value of $250,000. The pig iron produced was valued at $1,425,000 and the steel at $3,800,000. Steel rails, rods, etc., were produced to the value of $8,112,000. The products of the forest were worth $2,000,000.

Statistics of Building During the Year 1908

Returns Showing Comparison in Montreal, Toronto, Winnipeg, etc.

The city of Toronto affords a good example of the conditions prevailing throughout Canada. The year 1908 was a remarkable one in the city's development. In wealth, in population, in area and in every department of the city's life the increase is equally noticeable. Annexation contributed greatly to this increase, but the increase within the city's boundaries of a year ago has in itself been remarkable. According to the latest returns of the Assessment Commissioner the population of the city was 287,201, an increase over his own figures for the year of 14,601, or 5.3 per cent. The police census approximation to the number of people living in the city. approximation to the number of people living in the city. With recently annexed districts the actual population of the city to-day is 308,911. In 1905, when the last previous police census was taken, the population of the city was 221,583, making the increase in the last ten years very nearly 40 per cent.

There has also been a material increase of the wealth of the city, as shown in the year's assessment. The total assessment for that part of the city within the old boundaries is $223,207,413, an increase of $16,822,160, or, of over eight per cent. To this must be added the assessment of East Toronto, which is $1,927,345, and the assessment of Deer Park, which has not yet been completed. With East Toronto, the total assessment is brought up to $225,134,758.

Among the different departments of the assessment, the greatest proportial increase was in taxable incomes, in which the assessment for the year was increased by $1,280,083, or a little over 13 per cent. Taxable incomes are assessed at $10,899,732. The next greatest proportionate increase was in the value of buildings, which increased practically ten per cent. The increase was $9,406,520, and the buildings in the city are to-day assessed at $103,752,548. The prosperity of the city has been reflected in the land values, the assessment of which increased during the year by $4,774,631, or six per cent., to $83,386,481. Business assessments increased by $1,360,926, or five per cent., to $25,168,652.

The amount of municipal works undertaken gives the best instance of the progressiveness of the city. The city began the year 1908 by authorizing the council to enter into a contract with the Ontario Hydro-Electric Commission for a supply of power from Niagara Falls. The year saw good progress made in the project, which means so much to the future of the city. In November the first sod was turned for the transmission line between Toronto and Niagara Falls. The plans for the city's distribution plant have been gone on with, and to-day are practically completed. The year also saw other very important municipal works completed, and others, no less important, begun. The tunnel under the bay is completed. Another important work completed during the year is the high pressure, which is now ready to be put into operation. Among important public buildings completed during the year is the public library on College street. A new morgue, a new fire station, and two new police stations have also been added to the city's assets. Two important projects have been advanced so that actual work will begin during this year. They are the trunk sewer and the sewage disposal plant, in connection with it and the filtration plant. These together, will mean a clean harbor for the city, and absolutely pure drinking water for the citizens.

According to the returns issued by the City Architect's Department, permits were issued for the erection of 5,271 new buildings during the year, the aggregate value of which was $12,502,467. During 1907 permits were issued for 5,051 new buildings, at an aggregate value of $14,225,800.

The season of 1909 opens with a prospect for many more important municipal works being undertaken. Six new police stations have been necessitated by the annexation of outlying municipalities. The trunk sewer and filtration plants are to be built. A four-track viaduct for the railways along the Esplanade is now a thing of the near future, and several bridges must accompany it. Private building shows signs of being unusually extensive also. Toronto therefore will be a good place for builders, contractors, engineers and architects during 1909. The same, however, can be said of many another Canadian city, and there is therefore good reason to look forward with optimistic vision to the season of 1909.

Following are the comparative figures of the building permits by months during the year:

	1908	1907
January	$ 474,453	$ 782.166
February	258.640	781.135
March	838,130	1.508.530
April	1,169.635	2.044.870
May	1,216.982	2.557.964
June	1.055,405	1.445.230
July	1,219.431	3.221.000
August	1,274.185	1,202.410
September	1.110.040	763.340
October	1,019.492	776.555
November	1.378.649	638.150
December (approximate)	707,405	607,015

Montreal's Figures.

The value of new buildings and repairs made to old ones in Montreal for the year 1908 amounts to $5,062,326, as compared with $8,406.229 for 1907, the difference being $3,343,903. Following is the record by months:

	Permits.	New bldgs.
January	27	$ 55.650
February	44	72.590
March	101	137,568
April	139	267,065
May	156	509.960
June	127	416,080
July	131	391,620
August	147	691.250
September	139	636.275
October	127	377,085
November	103	264.610
December	42	498.000
Totals	**1,283**	**$4,317,753**

The foregoing refers to new buildings only. As regards repairing of old buildings, the total for the year was about equal to that of 1907. The repairing for the year amounted to $744.573, and the estimated value of new buildings was $4,317,753, making the total of $5,-

062,326. It cannot be denied, however, that 1908 was a poor building year for Montreal. December showed a marked improvement over November, the value of the buildings for the latter being $264,600, and for the former $498,000.

Winnipeg's Returns.

The Winnipeg building department records show that during 1908 there were 1,546 building permits issued covering 1,771 buildings, erected at a total cost of $5,447,200.

The following tables show the comparison of the building by months for 1908 and 1907:

1908	Permits	Bldgs.	Cost
January	31	32	$ 16,550
February	21	21	10,350
March	64	73	114,100
April	191	221	642,900
May	211	231	653,350
June	196	229	792,000
July	169	215	1,393,750
August	192	214	596,100
September	202	236	478,600
October	144	168	436,600
November	94	100	224,100
December	31	31	88,500
	1,546	1,771	$5,447,200

1907	Permits	Bldgs.	Cost
January	48	54	$ 63,200
February	82	92	200,600
March	225	264	703,000
April	464	537	1,175,400
May	450	549	1,190,700
June	337	412	1,110,600
July	273	352	914,550
August	164	181	394,000
September	139	150	385,000
October	95	96	134,000
November	125	132	138,400
December	41	45	37,505
	2,443	2,827	$6,447,050
Cancellations	10	10	138,100
Grand totals	2,433	2,827	$6,309,950

Further Comparisons

Below is shown in short form the record of building activity in Winnipeg by years since the year 1900:

Year	Permits	Bldgs.	Cost
1900	530	658	$ 1,551,863
1901	630	820	1,708,557
1902	822	973	2,408,125
1903	1,227	1,593	5,689,400
1904	1,768	2,268	9,651,750
1905	3,349	4,099	10,840,150
1906	3,437	4,204	12,625,950
1907	2,433	2,827	6,309,950
1908	1,546	1,771	5,447,200

Vancouver's building permits for the year are $5,920,000, an increase of $300,000 over those of 1907, which was considered the best year for building.

According to the permits filed in the City Engineer's office, the value of the buildings erected in Lethbridge during the year 1908 totalled $363,233. In 1907 the permits totalled about $205,000. This year promises to be an active one.

Railroad Construction in 1908

It is estimated that it will take no less a sum than $90,000,000 to carry out the various Canadian railway projects for 1909; and this estimate is a conservative one, based upon contracts already placed and plans confirmed.

In 1908 railway lines in this country increased 21 per cent., or by 1,248 miles. There are at present under construction 4,327 miles, so that the very large expenditure to which the railways are already committed will not be entirely used in 1909, although this year will mark one of the greatest periods of railway construction in the history of the country. In addition to the laying of steel the expenditure on terminals and equipment will be very heavy, a canvass of Canadian locomotive and car shops disclosing orders for many months ahead. About 210 miles of steel of the National Transcontinental were laid during the year, and grading is well under way on nearly all of the contracts let by the commission. The total evpenditure on the national railway to date has been about $47,000,000. The most active operations this year will be between La Tuque, Que. ,and Moncton, and upon the first 180 miles east of Winnipeg, upon which the work of steel laying will be well advanced by the end of 1909. Terminal shops will be begun at Winnipeg and Moncton. The contracts for the last section of the road between Moncton and Winnipeg have been signed.

Remarkable progress has been made by the Transcontinental and Grand Trunk Pacific. There is actually completed of the latter road 660 miles west from Winnipeg into Alberta. Contractors' equipment necessary for the construction of terminals at Prince Rupert and for the first 100 miles from that point eastward has already been landed at the new Pacific port. Tenders for the second 100 miles of track east of Prince Rupert are to be called at an early date, and grading is finished for 120 miles west of Edmonton. Trains will be in operation from Port Arthur to Edmonton within a few months.

Plans of the Grand Trunk Railway provide for the active prosecution of the double-tracking of that system and for the construction of a number of new lines and bridge work. The heavy work of the past year included the filling in of a long stretch in the Ottawa division through Algonquin Park and the construction of a large bridge over the Richelieu River at Beloeil.

The Canadian Pacific Railway will have over 500 miles, at least, of road under construction during the coming year. One of the most important works during the past year was the completion of the Sudbury branch from Bolton Junction to Romford Junction, which gives communication between Toronto and the main Transcontinental line of the C.P.R. The C.P.R.'s construction in Ontario also included the 20-mile branch from Embro to St. Mary's, making a total for this road in Ontario of some 250 miles completed in 1908. During the current year the branch line from Coldwater Junction to Peterborough, a part of the scheme for a short rail route between Montreal and Georgian Bay ports, will be in the hands of contractors. It is anticipated, also, that in the next twelve months 40 additional miles will be added to the double-tracking of the C.P.R. between Toronto and Montreal. The length of double-track in operation between Montreal and Smith's Falls at present is about 80 miles

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Indirect Steam Heating.

A system of steam heating costs more to install, but has some advantages over a furnace, especially in houses of large size. These are the ability to carry the heat to any room, no matter how distant, from a single boiler which may be located where most convenient; and again, the heat-supply to all rooms will be practically the same regardless of the direction or strength of the wind. In the case of a furnace the horizontal distances which the heat can be carried with satisfactory results are limited, hence in large houses it is necessary to employ two or more furnaces located at a distance from each other. This is a matter of considerable inconvenience in caring for fires, and the handling of coal and ashes.

With steam heat, a single boiler may be used, which results in a greater degree of convenience and also in a saving of fuel, as a single fire of sufficient size may be run more economically than several smaller ones generating the same amount of heat. Steam heating is divided into the direct and indirect systems. In the former, the radiators are placed in the rooms and give off their heat directly to the air in the same manner as a stove. In indirect heating, the radiators are commonly called "stacks," and are placed near the basement ceiling, with flues running from them to the rooms above. The action of one of these stacks is similar to that of a hot air furnace. The stack or heater is encased in galvanized iron with a space above and below it. The lower space is connected with the outside air, which is admitted through a duct or cold-air box the same as in furnace heating. The air passes upward through the spaces between the hot sections of the stack, and becoming heated, rises through the warm-air flue connecting with the upper space, and enters the room through a register. The direct and indirect systems are often combined in the same house; the latter being used for the more important rooms where a supply of fresh air is desired or where the appearance of a direct radiator is objectionable.

Indirect heating is affected to some extent by strong winds, but is more reliable than a hot air furnace because the stack is placed close to the base of the flue so that the warm air is more likely to rise than when it has first to be forced through a long horizontal pipe as in the case of furnace heating. At the same time the action of the air currents will be more or less affected unless the cold-air inlets are properly placed. These, as in the case of furnace heating, should be on the north or west sides of the house, if possible. In some cases, it will not be found practical to do this, in which event both the inlet and stack should be made somewhat larger than usual and the stack should be placed directly beneath the warm-air flue.

The best arrangement, although somewhat more expensive, is to carry a supply duct entirely through the building at the basement ceiling, with openings at both ends. In this way the chances of air blowing into the duct are doubled over the usual arrangement. This duct should be made of sufficient size to supply all of the indirect stacks, which should connect with it by means of branch pipes. If it is not convenient to use this scheme, the more important stack may be arranged in this manner, while those a considerable distance away may have separate inlets or supplies.

The temperature of the room heated by the indirect system may be regulated either by partially opening or closing the warm-air register, or better, by the use of a mixing damper placed at the stack and operated by means of a chain and catch-plate attached to the register face or to the wall near it. This device is an arrangement familiar to steam fitters and furnace men, and is for the purpose of mixing a certain portion of cold air with the hot air which has passed through the heater, thus lowering its temperature and consequently that of the room.

Indirect Radiator with Pure Air Duct.

Direct steam is especially adapted to the less important rooms, or where ventilation is not required, as in stair halls, corridors, etc. Bedrooms are comfortably heated by direct radiators because there is usually sufficient in leakage of fresh air around the windows for all the ventilation that is required during the day, and at night, open windows with screens to prevent too strong a draft upon the occupants is the best form of ventilation.

Among the objections which were common before modern improved apparatus and methods of installation corrected the difficulties are the following: Difficulty in regulating the temperature of the rooms in mild weather; the unsightly appearance of direct radiators in handsomely finished rooms; the possibility of leaks in concealed steam and return pipes; water-hammer and snapping in the pipes; the filling of the radiators with water and resulting leakage through open air valves; dripping of certain forms of automatic air valves; difficulty in sweeping and cleaning under the usual form of floor radiators. Some of the objections still obtain among the users of old apparatus installed many years ago before steam and water fitting reached its present status of improved workmanship. But as we propose to show even on old installations great improvements can be made.

Let us take these up briefly in order, and see how these difficulties can be overcome, or at least reduced to a considerable extent. Temperature regulation in the case of indirect heating can be secured by the use of mixing dampers, as already stated. These may be operated by hand, or, if the matter of expense does not preclude it, one of the forms of automatic regulation may be used to advantage. The matter of obtaining the desired temperature when direct radiation is used is not so easy of accomplishment, especially in the mild weather of spring and fall.

The size of the radiator must necessarily be proportioned for the coldest weather, and as they are always at practically the same temperature when steam filled, it follows that in mild weather the rooms will become overheated unless the radiators are shut off and turned on at frequent intervals, or open windows are employed to lower the temperature. The latter method is often practised by those not directly interested in the size of the coal bill, which results in a considerable waste of fuel. In houses heated with direct steam very satisfactory results may be obtained in mild weather by first warming up the house in the morning with all of the radiators on, then shutting off all but two or three on the lower floor as may be needed and opening doors into halls and corridors. This is in effect the same as considering the whole house as a single room with several radiators, and using only a sufficient number of these as may be needed. Sometimes vacuum air valves, so called, are used with good results if the system of piping is tight. These allow a steam pressure to be carried considerably below that of the atmosphere, thus reducing the temperature of the steam and approaching to some extent the effect of hot-water heating. An arrangement sometimes used with very satisfactory results consists in enclosing the boiler in a brick chamber, allowing a considerable space around the boiler and also above it. In basements of ordinary height the brickwork is caried nearly to the ceiling and the chamber tightly closed in with a top of galvanized iron or other fireproof material. Within this chamber, above the boiler, is a large indirect stack for supplying heat to one or more of the most important rooms. Fresh air from out of doors is supplied at the bottom of the chamber and rising in the space around the uncovered boiler becomes heated at a moderate temperature. It now passes through the indirect heating stack and becomes still further warmed before passing to the rooms above. The advantage of this arrangement is that in mild weather a light fire may be carried, just sufficient to heat up the boiler and water, but not hot enough to generate steam. In this way the boiler acts as a hot-air furnace, the fresh air passing through the chamber becoming sufficiently heated to warm the rooms without the use of steam in the stack.

If the radiators are provided with vacuum air-valves, a very low steam pressure may be carried, somewhat below that of the atmosphere as the weather becomes colder, and in severe winter weather the usual pressure of three to five pounds may be carried. Another feature of the chamber system is that during the night, after the steam pressure has gone down and the radiators become cold, warm air will still continue to flow through the registers as long as there is a fire in the furnace, thus preventing the rooms from being chilled in the morning as would otherwise be the case.

The unsightly effect of direct radiators may be almost if not entirely avoided by using proper care in their selection and decoration. A rather low radiator of fair length gives a much better appearance and at the same time is more efficient than one which is high and narrow. The location also has much to do with the looks of a radiator. The general arrangement of the furniture should be considered and the radiator located where it will be inconspicuous and out of the way as much as possible. At the same time, if the room is an exposed one, the radiators should be near the outer walls. In small rooms it is not of so much importance, because if it is of sufficient size the air currents will equalize the temperature in different parts of the room. Concealing radiators by screens or placing them in recesses behind heavy grills is not to be recommended, as it interferes with the free movement of air over them and thus reduces their effectiveness. The radiator, if properly designed, should be no more objectionable in appearance than a screen. The pattern should be selected by the architect to suit the location, and its treatment should correspond with the general color scheme of the room.

For the greatest efficiency as a heater, the radiator should not be too high, and rather shallow, two columns being better than three except for the larger sizes, and there should be ample space for the circulation of air between the sections. So far as leaks in concealed pipes are concerned, it is best to avoid them by keeping the pipes and risers accessible. The risers to upper floors may usually be carried up in closets, hallways, corners of rooms, etc. When carefully run in true vertical positions close to the walls and painted to correspond, they are not conspicuous.

No system of steam heating should be accepted as satisfactory in which water-hammer or snapping in the pipes and radiators persist after they have become warmed up, and even when steam is first turned into a cold radiator there should be but a slight disturbance, if any. The chances of water-hammer will be practically eliminated if the main returns are sealed; that is, run near the basement floor below the water-line of the boiler so that they remain filled with water at all times. In addition to this, all overhead piping should be of ample size for work, sharply graded to secure proper drainage, and free from all pockets for the collection of condensation. A proper observance of the above will remove all difficulty and secure quietness of operation in nearly every case.

It is true that it is difficult to clean the floor properly beneath a radiator, especially if it is covered with a carpet. In the case of small radiators they may be removed from the floor entirely and supported upon the wall, several special patterns being made for this particular purpose. Larger sizes may be provided with what are known as carpet-feet. This arrangement raises the radiator somewhat and leaves the space beneath it unobstructed and accessible for cleaning.—Charles L. Hubbard, in "The House Beautiful."

The Necessity for High Quality of Plumbing.

Economy, as applied to the work of the plumber, cannot be regarded as synonymous with cheapness of cost, says "Shoppell's Magazine." Cheap plumbing is always expensive in the end, making necessary continual and expensive repairs, which would have been avoided, had the work been done properly and with proper materials at first. Practical, go-ahead plumbers, who are holding their own in the business, are not liable to adopt new systems, unless their merits have been established by actual tests. The same articles that have been used for years are still being employed, in many cases, although they are looked upon as "old-fashioned," because they are designed in proper proportions in every respect. and not only operate in a satisfactory manner, but have their parts so arranged that they are capable of giving first-class service, even after they have been used, and "abused," for several years. Some of these old supplies really cost more money than newer ones which have been invented to supplant them, but, in the end, they are the more economical of the two.

One of the methods employed by manufacturers of the new designs of plumbing supplies, to cheapen their products, has been to make brass goods of excellent design, but which are so scant in real brass that they cannot be regarded as constructions of real merit. The saving of the brass cheapens the product, and makes it attractive to the owner or builder who rates economy only by dollars and cents; but the use of such makeshift supplies always results in eventual loss in dollars and cents. The designs are not strong enough to sustain the strain to which they are subjected, and the result is that they are constantly getting out of order and necessitating a call on the plumber for repairs, which involves the payment of more money.

Heavier brass goods than some which are used efficiently are often properly rejected by the conscientious plumber because they are faulty in design and proportion. There are water-closet combinations on the market which are so faulty in their action that the poor plumber who is so unfortunate as to be attracted by their cheap price will have lots of trouble before he can induce his customers to cease their complaints, if he does not have to substitute some really fine goods when he has a customer who understands how a water closet should operate. Owners who have learned the difference between good enamelware and seconds and thirds, are very much at a disadvantage when they have to figure against a plumber who intends using one of the competition tubs, especially when the competition tub does not bear the stamp of its quality upon it.

Owners and builders should always choose the very best in their purchases of plumbers' supplies. The plumbing is in reality the most important part in the constructor of a home. If this is faulty, it makes no difference how elegant the design of the building, or how elaborately it is decorated to attract the eye, the structure is a failure, and constant worry and annoyance is waiting for the occupant.

Plaster and Cement Notes.

The Dominion Steel Company has been prospecting at South Gut, N.S., during the past summer with a view to opening up limestone quarries. The limestone formations there extend in length two and a half miles and have an unusually high percentage of pure calcium carbonate. This, together with the advantage of proximity to the steel works, gives reason to expect that the Steel Company may begin operations during the coming season.

The Newark Plaster Company have secured extensive gypsum deposits at McKinnon's Harbor, N.S., and vicinity. A dredge operating on behalf of the Dominion Government has been at work there from September last. There are now eighteen feet of water in that part of the channel which has been dredged. Next spring the dredging is expected to be completed, when gypsum mining operations will commence on a large scale.

The Sydney Cement Company, of Sydney, N.S., report that their output for 1908 was only five per cent. less than in 1907, which was a banner year. The company intend this year to go into the manufacture of brick from slag. Tests made by the Berg Machinery Company of Toronto have indicated that an excellent brick can be made from the crushed slag. The Cement Company forwarded samples of their product to Toronto some time ago and the Berg Company, after investigating the matter, reported that this was a good proposition. The Cement Company expect to install machinery for pressing brick this year. This addition will double the amount of slag to be ground.

Illustrations—A House at Barrie.

The house plans reproduced on the opposite page are for a residence at Barrie, by Chapman & McGiffin, 59 Yonge street, Toronto. The house is designed for a location on the slope of a large hill at the back of the town, and overlooking Kempenfeldt Bay. The building is of red brick, with shingle roof stained green. The trimmings are picked out in white.

Calendars Received.

The Rogers Supply Company, 3 King street east, Toronto, dealers in "Lehigh" Portland cement, crushed and building stone, have favored us with a dainty calendar with an attractive colored picture.

The Universal Portland Cement Company, Chicago and Pittsburg, have sent us a striking calendar with a strong design of concrete with the gravel exposed. The whole calendar is in an attractive grey color and the dates are generously large.

Dale, Reynolds & Company, Limited, 46 Cannon street, London, E.C., publishers of the "Decorators' & Painters' Magazine," have issued a tastefully designed calendar in green and slate blue, a copy of which we have been favored with.

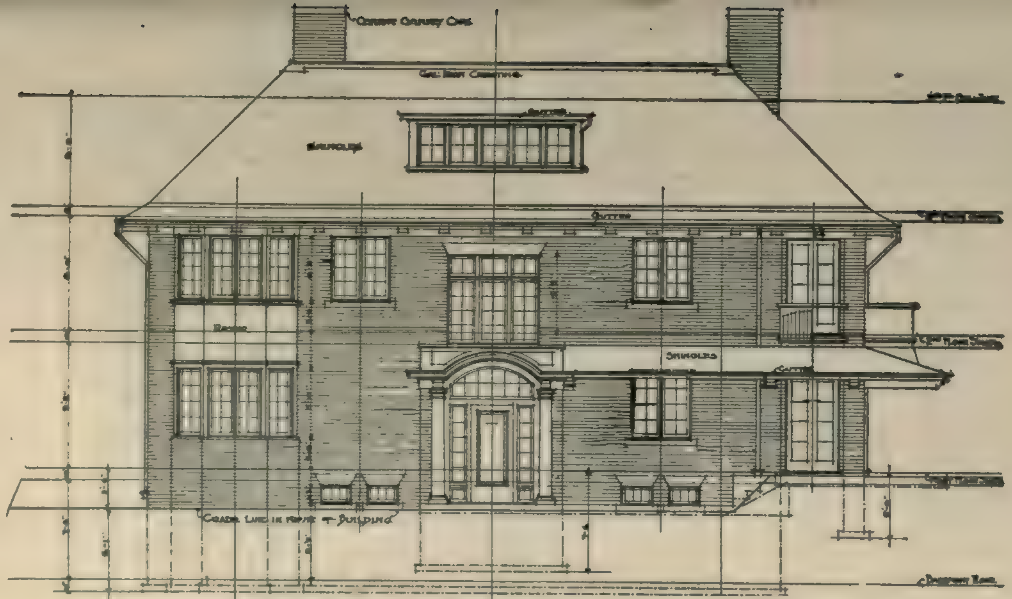
W. J. Hynes, contractor and plasterer, 16 Gould street, Toronto, has sent a re-fill for the attractive staff calendar with which he favored us last year. The re-fill is in the form of a pad with a large square space devoted to each day.

The Winnipeg Development & Industrial Bureau has issued a splendid calendar containing a quantity of interesting statistics regarding the growth of the city. The calendar itself is a reflection of the industry and business instincts of the people of Winnipeg, in that it is the production of men of keen business ability.

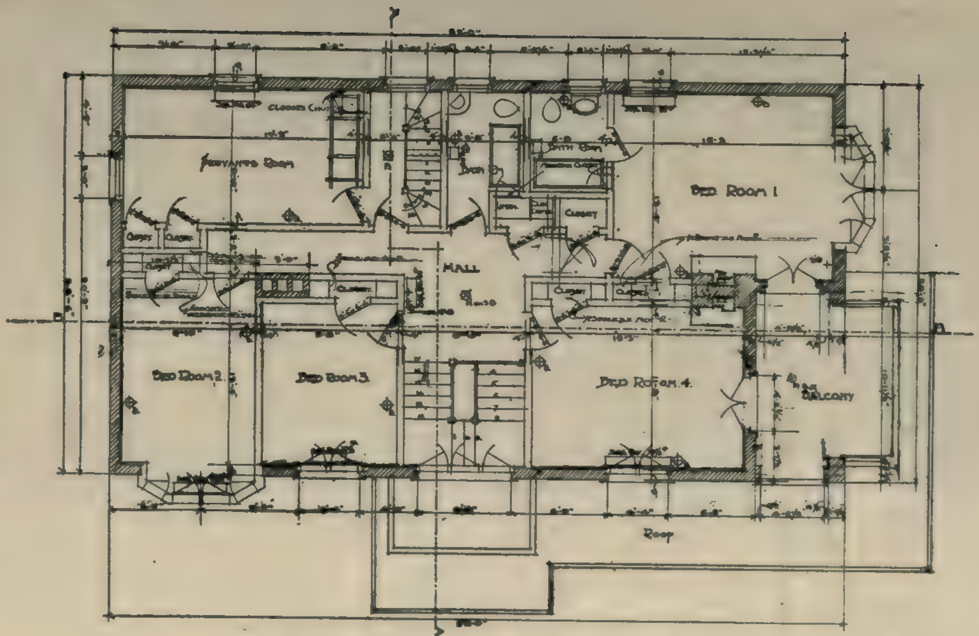
Britnell & Company, Limited, Toronto, dealers in building and crushed stone and builders' supplies, have favored the "Contract Record" with an artistic picture calendar for 1909. The subject is "The Call," depicting a stretch of typical Canadian mountain scenery with a moose in the foreground bellowing for his mate.

The B. Greening Wire Company, Limited, Hamilton, Ont., have favored the "Contract Record" with a copy of their 1909 calendar, which takes the usual form of a large pad for office use, with an attractive view of the company's works. The firm are at present engaged in the preparation of new catalogues for all branches of their business, which will be ready for distribution sometime in February.

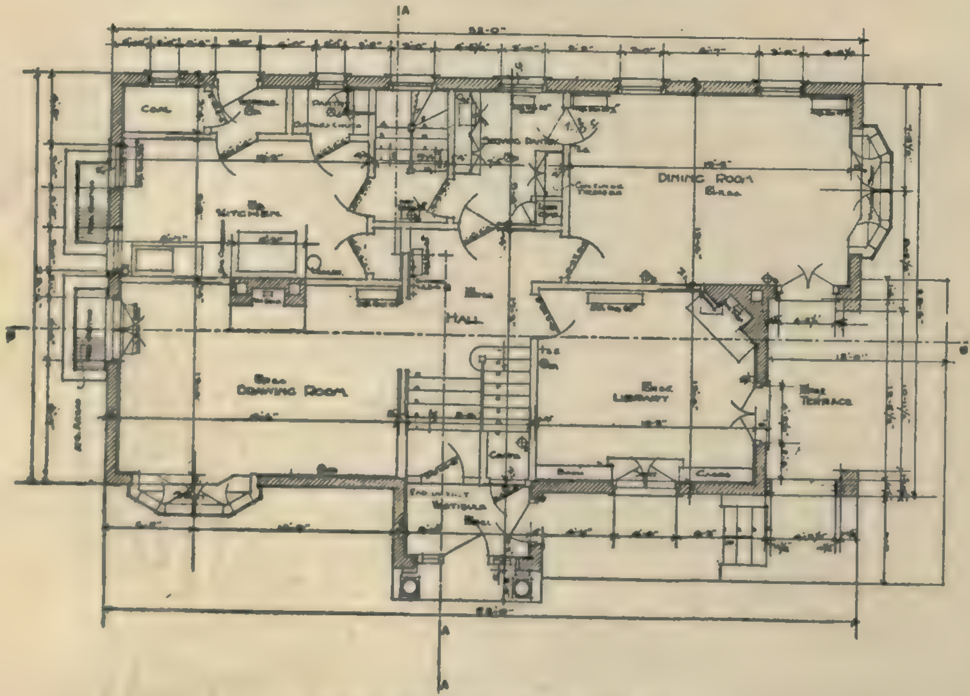
Mussens Limited, Montreal, Toronto, Cobalt, Winnipeg and Vancouver, have favored us with a large wall calendar, bearing on each sheet a large illustration of some of the company's products. Mussen's Limited produce a wide range of machinery and supplies for railroads, mines, municipalities, contractors, factories, mills, etc. They make a specialty of designing rock crushing, concrete mixing, mining and hoisting plants. Their 1909 calendar, like all their other products, is a credit to the company.



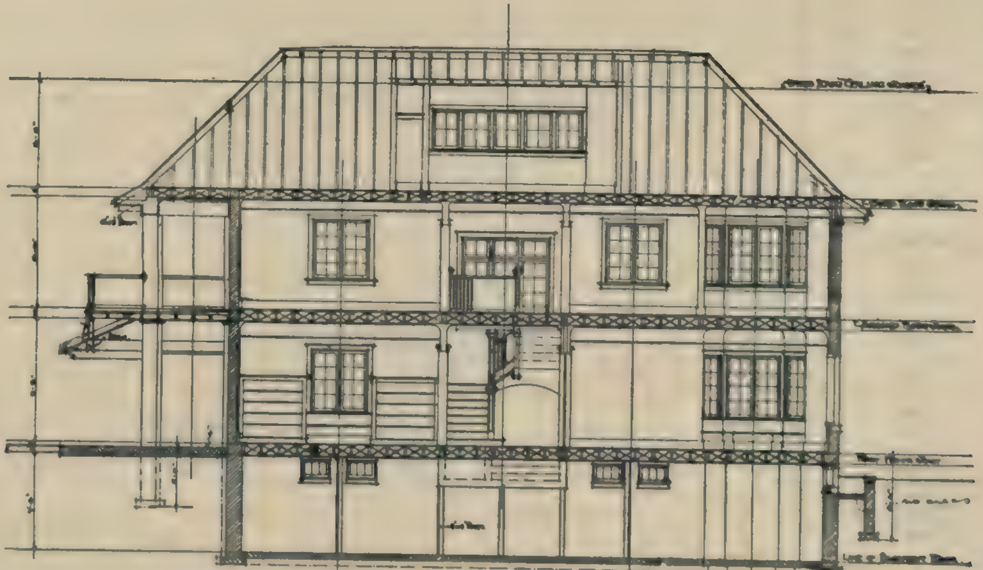
A Barrie Residence—Front Elevation—Chapman & McGiffin, Architects.



A Barrie Residence—Second Floor Plan.



A Barrie Residence—First Floor Plan.



A Barrie Residence—Sectional Plan.

CHAPMAN + McGIFFEN, ARCHITECTS [illegible]

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

Sewer Construction—Its Relation to Civic Expenditure.

The following letter regarding the question of civic expenditures, with reference particularly to the comparison of brick and concrete for sewer construction, has been received from Mr. Henry Holgate, C.E., of Ross & Holgate, Montreal. It wil be read with much interest on account of the controversy at present under way in Toronto. Mr. Holgate says: The sound principle in all questions of expenditure is, to get the best results for a dollar, especially should this be true of public bodies in spending public money. A very large proportion of the expenditure of a city goes toward the construction of works for the benefit and physical improvement of the city, and in this, the advice and judgment of the engineers should outweigh that of others, though they may be acting in what they think to be the interests of the community. In the inception of public works, and in the discussion of them, there often arise questions advanced for some local reason, or raised by a section of the people interested more or less in having the work done in some particular way, which in their opinion is better.

Discussion is always a good thing, provided the basis of discussion be sound, and the arguments if good should be listened to, and whatever profit can be derived should be taken advantage of. Unfortunately it is almost the rule that the greatest discussion comes from what may be termed local sources, very often to the neglect of the main question, which is: "What is best to be done in the interests of the whole community?" Owing to the obtrusion of local argument in cases where the question is a general one, and to the fact that such arguments have prevailed and have influenced large expenditure, these expenditures in the past have resulted in the carrying out of works which have proven in later years to have been either badly constructed, inadequate in themselves, or proved a misfit in the general scheme of development, and have had to be replaced with other works at great expense.

Almost every town or city has been guilty of these indiscretions, partly from circumstances such as phenomenal development, lack of foresight, ward politics or the desire to satisfy some particular class of citizens, and for these reasons the credit of the corporation is gradually but surely lowered if such a course is persisted in, and this accounts for some municipal bonds selling at 85 where they should bring par, or be sold at a premium. Investors are not blind, and the first thing looked into in the question of capital expenditure is,: "Is the public money wisely or unwisely spent?"

When a public work is required for a city, the nature and requirements of it are studied by the engineer who is, or should be, absolutely free from local influence, and acts in the interests of the whole city. His study and the decision arrived at by him may be taken as the proper course for the city to follow in the interests of the whole community, and unless some strong reason is advanced to alter his plans, his are the plans that should be carried out. Aldermen are not elected to act as engineers, they are expected to act as the watch dogs on the public treasury, and must repose confidence in their engineering adviser, and assist him in carrying out his plans, which presumably are based upon the principle of obtaining the most possible for a dollar.

It must not be understood that the appointed engineer in the employ of the city is necessarily constituted the dictator, but what is meant is that expenditure on public works should be undertaken only upon engineering advice, and the city should fortify itself with the soundest advice obtainable from engineering sources before authorizing expenditures. Once having established such a method of procedure, there will be no encouragement for sectional opinions influencing capital expenditure, and capital will then be more efficiently expended than under other conditions, and efficiency should be the aim of every municipal governing body.

This "most possible for a dollar" does not necessarily mean something cheap and temporary, but it means such adequate works as, the expenditure on which, together with the cost of repairs and renewals will create the smallest annual charge in perpetuity.

In most cases this leads to the adoption of works of so called permanent construction, and as there is often more than one method of permanent construction, these methods are compared for final decision as to which will be adopted, the relative value of materials being considered as well as the relative costs of the two or more systems of construction, and the one having the lowest annual charge should be adopted.

If questions involving capital expenditure are treated in this way systematically by a city, the effect on its credit will soon be apparent, because investors will at once appreciate the intelligence of such a course, and will be assured that at least in this direction the city is being wisely governed, and their confidence will be increased, which will be shown by the higher price at which the city's bonds will be sold, and neglect of this must certainly have the reverse effect.

The aldermen, being the trustees of the citizens must, as their duty, consider these matters in this way, and any departure from so well founded a principle must certainly have some very forcible reason, but it would be a very extraordinary case that could possibly afford a reason strong enough to cause any departure from it.

There is nothing particularly new or original in the foregoing, but it all is applicable in nearly every case of money spending in every municipality, large or small.

From the public press I have learned that in Toronto there is at present a question which apparently is exciting some interest, and which may perhaps be considered as a case in point. I refer to the work in connection with the main drainage works of the city and the high level intercepting sewer; the circumstances in connection with which, as I understand them ,are as follows:

The city engineer calls for tenders for a concrete sewer and apparently there was no question of brick being used. A large number of employees of brick concerns, however, who had hoped to obtain employment as a result of the building of the sewer, formed a deputation and waited upon the Board of Control and presented their claims. These claims were largely based upon the fact that in the building of a brick sewer there would be a great many more men employed than in the building of a concrete sewer. The matter of relative costs was not taken up by the deputation to any extent. They did claim, however, that a better sewer could be constructed of brick and endeavored to arouse some uneasiness in regard to the merits of concrete. Apparently the whole question then is one relating to the amount of labor to be employed, and as this was brought up, it opened the whole question of the relative values of the two materials, and it was decided to instruct the city engineer to call for tenders for brick. The tenders for concrete are already in and the matter has been shelved until the city engineer can receive brick tenders and come to his own conclusions in the matter.

No council can decline to receive deputations, and it is wise to listen to argument, but it is the duty of the governing body to see that they get the most for a dollar and not be influenced by any side issues.

The city engineer was right in asking for tenders on a concrete sewer; a sewer of these dimensions lends itself well to construction in this material, it is no experiment, we know what results will be obtained, they are certain to be satisfactory. For a long time past such works have been built of concrete, that previously had been built of other materials, and have proved cheaper and stronger; the art of constructing in concrete has made very rapid advances during the past few years, and today is stands out eminently as the most satisfactory material that we have for heavy permanent work, and is encroaching seriously also on the field once controlled by steel and iron. The element of uncertainty in the use of concrete for the purpose of this large sewer does not exist.

In this particular case, were tenders for brick construction the same as for construction in concrete, it would then remain for the engineer to say which to adopt on the basis of value to be received for the expenditure, and I feel that if the matter is to be decided upon engineering and financial reasons, the decision of the city will be to construct this important permanent work in concrete.

A number of letters have also been received by the "Contract Record" regarding the material to be used for the Toronto trunk sewer.

A Contractor's Opinion.

Mr. A. W. Godson, of the Godson Contracting Company, Toronto, says:

"As a contractor and from a contract point of view, I prefer brick for the construction of Toronto's trunk sewer, as it will add about one-third to the cost and our profits are based on a percentage of cost of work—but as a citizen and contributor to the assessment I agree with the engineer's recommendation, and I also agree with his statement as to this being a concrete age. With the appliances now provided for all concrete work there is no reason why it should not prove the best all round."

A Consulting Engineer's Views.

Mr. C. H. Mitchell, C.E., Toronto, says:

"I am of the opinion that concrete construction will be preferable to brick for the trunk sewer contemplated by the city of Toronto. This is on the assumption, of course, that first-class work is done in either case. I consider that concrete thoroughly well built of first-class materials according to proper design, will not only be better suited for the purpose but will be cheaper in first cost and is probably cheaper in maintenance.

"Brick work is more likely to be porous and to lack the homogeneous qualities of concrete, owing to the different degrees of hardness of each brick and consequently, unless the most rigid inspection and a special quality of expensive, uniformly hard-burned bricks are employed, there will soon result leaks and deterioration of different bricks exposed to liquids and gases.

"In either case the invert on which the average flow occurs would probably be built of special paving bricks to permit of easier repairs.

"It is true that the tunnels at Niagara Falls are lined with bricks, but these were of a very expensive quality and carried clean water without any injurious liquids or gases.

"Concrete construction for the structure is undoubtedly much cheaper than brick work construction based on the present scale of prices for labor, and it is further likely that concrete construction would be more quickly built than brick work, all other things being equal."

Canadian Clay Suitable for Paving.

In connection with the controversy which has been going on recently regarding the suitability of brick and concrete for the construction of the trunk sewer in Toronto, statements have been made that a good quality of paving brick could not be obtained in Canada. While to a certain extent true, this statement is not actually founded upon fact. There is in the Eastern Provinces a very valuable deposit of clay which has been tested and found to be the raw material for what will probably be the finest vitrified brick in the world. These deposits were discovered many years ago but have not yet been worked commercially owing to difficulties experienced in obtaining clear title to them. A company is being promoted at present with a view to manufacturing paving brick from this clay. According to the testimonials which have been received from eminent scientists and business men who have examined this clay, it is of surprisingly fine quality. Professor C. H. C. Wright, of the School of Practical Science, Toronto, made a series of tests of brick manufactured from it and found that under a rumbling test the average loss per brick with the first rumble was only 17.07 per cent., and with two rumbles 20.07 per cent. The absorption test showed that there was no absorption whatever. Under the transverse test the brick, with a distance of six inches between the centres of supports, stood an average of 10,900 lbs. An interesting testimonial for this clay was given by Mr. J. E. J. Baxter, of the firm of Clementson Bros., Hanley, Staffordshire, England, who stated that he had every reason to believe that brick and tiles made from it would be of a vitrescence and durability unknown in any clay which had been discovered in England.

From experiments which have been made it is assured that this clay will take an excellent glaze. Samples which were sent to England were manufactured into earthenware and the resulting product was of a highly glazed and very attractive rich chocolate color.

Samples of bricks and pottery made from this clay have been sent to the "Contract Record," and apparently they bear out all the good things that have been said of them. Anyone who is interested in the matter may see them at the office.

Good Brick Obtainable for Sewers.

In regard to the quality of brick obtainable at Toronto for use in sewer construction the Port Credit Brick Company write as follows:

"It has been said that brick of proper quality cannot be obtained in or near Toronto; that in order to get the article required, the corporation would have to go as far as Beamsville or farther. We believe this statement was made before our brick had been submitted.

"We are prepared to supply brick in quantities sufficient for the requirements of this work which have stood a 6 per cent. absorption test, and also over 8,000 pounds compressive strength per square inch. We understand the above test is satisfactory for the work. This statement is written without prejudice, and simply to explain that the proper article can be obtained at our city's gates."

Various Methods of Making Sewer Pipe.

The manufacture of cement sewer pipe has been extensively practiced in different parts of Europe for many years, says Rudolph Hering in "The National Builder." The cement used for the purpose was Portland cement, the strongest and most reliable of the common cements for building purposes.

In the following, reference is made to cement pipes twelve inches in diameter and larger until the pipes become so large that it is cheaper to form concrete in place in a trench than to make the pipes outside and transport them to the trench.

The following advantages of cement or concrete over vitfrified clay pipes can be enumerated when both are well made of the best and most suitable materials:

(1.) A sectional form can be given them which is more conducive to stability and efficiency than round clay pipes.

It is only ten to fifteen years ago that Portland cement was first manufactured in the United States to any great extent. Prior thereto we used imported Portland cement, the expense of which greatly limited its use, and also the so-called American natural cement, which, though much cheaper, was also much inferior in strength and durability.

In the last decade we have been able to buy good American-made Portland cement at a reasonable price, and its use has therefore grown to large proportions. Whole bridges, retaining walls and houses are now built of concrete, plain or reinforced, and this method of building is rapidly increasing because strong structures can be built with it at a less cost than formerly.

Cement or concrete sewer pipe has partaken of the same development. Following the European practice, we have been able through the use of Portland cement to make equally good pipe, because we now have available the same material and similar machinery for manufacturing.

Cement sewer pipe has a competitor in the United States, perhaps to a greater extent than elsewhere, in vitrified clay pipe, which is very extensively manufactured, and is still almost exclusively used for small sewers. It is made in many states, can be moulded, dried, salt-glazed and burnt wherever suitable clay is found. Cement or concrete pipe can be made of broken stone, sand and cement wherever such materials can be brought together, which offers a filling into the space beneath the two sides of the pipe which are not slight, and often have been the cause of a breakage of the pipe on account of an insufficiently strong bearing due to hollows left by insufficient compression of the material. In fact, to get in this respect the same advantages as flat bottom cement pipe it is customary in some places to put a layer of concrete into the trench, upon which subsequently the vitrified pipe is laid, the concrete being then brought up to the spring of the pipe.

(c) The oval or "egg" shape for such sewers as have a variable flow has great advantages over a circular section, which is well known. It has not been found practicable to give the vitrified pipes a true oval section on account of the warping due to burning, and therefore only a circular shape is now generally in use. While this shape is sufficiently good for small pipe sewers less than twelve inches in diameter, it is often not as good as the egg shape for sewers over twelve inches in diameter. Cement and concrete sewers can as readily be made egg-shaped as circular.

(II.) As vitrified pipe warps in burning the section is not finished truly circular, and slight projections are formed at every joint when the pipes are laid to form a sewer. These projections are more or less objectionable in a sewer, because suspended matter catches and is retained thereby. Cement and concrete pipes, whether circular or egg-shaped, do not warp, and therefore can give a sewer an even surface upon which the sewage can flow.

(III.) As cement pipes have a truer sectional shape than vitrified pipes, they can be given a slanting butt joint, as is customary in Europe, instead of the more costly bell and spigot joint common for vitrified pipe, which are made in imitation of cast-iron pipe used under high pressures. Vitrified and cement pipes are never used under high pressure, and the hub and spigot joint, as now used, seems to be of advantage only to obviate the difficulties of joining two pipes which are not exactly true in section. The slanting butt joint is therefore quite rational for concrete pipes, while this is not so for vitrified pipes. It is less expensive to make, both in manufacturing the pipe and in joining the pipes with mortar in the trench.

(IV.) Concrete pipes are tougher, that is, less brittle than vitrified pipes. Therefore they are not as easily broken by rough handling and by having heavy matters drop upon them.

(V.) Concrete pipes, if well made of proper materials, have a strength to resist compressive, tensile and bursting strains which is amply sufficient for all purposes of a sewer in a large city.

The following disadvantages of cement over vitrified clay pipe are enumerated, supposing that both pipes are equally well made of respectively the best materials.

(I.) Portland cement used for the manufacture of concrete pipes is attacked by certain strong acids, such as sulphuric acid, which converts the carbonate into sulphate of lime, otherwise called gypsum, which is comparatively soft and easily eroded. Therefore, cement pipe is not generally used where strong acids are known to enter the sewers.

Vitrified pipe will stand the effects of most acids. When the joints are made of cement they will, of course, be acted upon by acids as readily as the cement pipes.

It should be added that the acid question must be viewed in a reasonable light. When the dilution by sewage is sufficient, the discharge of a small amount of even strong acid will not cause objectionable effects, as evidenced by European cities by the use of concrete sewers almost exclusively in some cities, as Paris and Vienna. In England concrete sewers are also very common.

It should be said that strong acids attack not only cement but bricks. But bricks are extensively used both in America and in Europe for large sewers. In fact, almost all large sewers are built either of brick or of concrete.

The greasy substance which is usually found to coat the perimeter of a sewer under the water-line tends to protect the cement from the action of acids.

(II.) Vitrified pipe resists greater bursting pressure than cement pipe. This quality is of value should a vitrified pipe be called upon to withstand a high pressure of water. Such resistance requires an equal resistance in the joints, which are usually made of cement.

For sewer purposes this high resistance of vitrified pipe to bursting pressure is not valuable. If a sewer can safely withstand the shocks of rapidly flowing water and the bursting pressure due to a complete filling of the sewer and running under a head equal to that existing when manholes are full and the sewage is running out in the street surface, we have secured the same against a failure from bursting.

(III.) Due to the glazing of vitrified pipes we get an advantage for them over cement pipes, which usually are not manufactured with an equally smooth surface. The advantage lies in the slightly better flow given to the sewage which is due to less resistance. But this advantage is cancelled in practice, sometimes wholly, by the additional resistance given to the flow of water by the projections at the joints of each pipe, due to their imperfect shape.

(IV.) The structure of the material of vitrified pipe sewers generally does not change.

If the materials are properly selected and none but Portland cement is used, and clean sand and stone properly mixed, and if the workmanship is equally good in both cases, then this difference no longer exists. We can see burnt clay pipes and bricks in Rome several thousand years old, and we can also see at the same place cement mortar of equal age and strength. We have concrete work in the sewers of Paris several hundred years old, and also concrete in more modern structures which we have no reason to believe will deteriorate.

It will be essential when using concrete to have sufficient and competent supervision of its manufacture, in order to assure the use of good materials and workmanship. Then there should be no doubt concerning its permanent efficiency, and when used for sewer pipes an equal permanence to that of vitrified pipe should be secured.

(V.) The material of vitrified pipe is generally more dense than that of cement pipe, and water under pressure will not as readily percolate through the body.

This quality is important when pipes run under pressure, which sewers, as a rule, do not. Even if sewage should enter the body by capillary, it would not go through the pipe as sewage. In either case it would somewhat resemble a Pasteur filter and purify the sewage. Leaks through imperfect joints as a rule would operate, with either vitrified clay or cement pipe, before a leakage would occur through the body of the pipe.

A serious accident, costing $2,500, and causing a couple of weeks' delay in construction, besides almost costing the life of an engineer, occurred recently on the Granville street bridge over False Creek, Vancouver, B.C. The travelling derrick was overbalanced while raising an 18-ton steel span girder. It toppled over, crashed through the bridge timbers and buried itself in the creek. It is believed that the accident was caused by the girder being given too much impetus when being swung around. The derrick, boom and legs were smashed to splinters and the girder was badly buckled.

Builders in Victoria and Vancouver are naturally gratified at the price rough lumber can be obtained at at present, and many men who had decided to postpone building are making arrangements to rush their work so as to take advantage of the low-priced lumber, as well as the present low wages. Lumber can be bought at this writing at $8 in Victoria and from $9 to $10 in Vancouver.

The strength of an iron column of cruciform section is only one-half that of a round column of the same weight of metal.

A Viaduct Ordered for Toronto.

The Dominion Board of Railway Commissioners have given an order for the construction of a four-track viaduct for elevating the railway tracks along the Esplanade, Toronto, between York and Cherry streets, and for the construction of bridges at John street, Spadina avenue and Bathurst streets. The order also makes provision for:

The extension of York street to the water front.

Abolishing tracks on the level at York, Bay, Yonge and Church streets.

Permitting shunting on level tracks each of Church street only during night.

Allowing no land damages for city property.

Payment of one-third of the cost of the work by the city.

Settlement of land damages by the city, the railway companies to pay two-thirds subsequently.

Arrangement between the city and the companies for expenses of removing York street bridge.

Mutual agreement, if possible, otherwise arbitration, to settle proportion of cost to be paid by each railway.

Mr. C. H. Rust, the City Engineer, speaking roughly, estimates that the cost of the viaduct will be about $2,000,000, of which the city's share would be between $500,000 and $750,000.

It is expected that the railways will appeal from the order to the Supreme Court.

Lead Pencils for Every Use.

In these days when every man carries a lead pencil in his pocket, few of us ever give a thought to the patient efforts that were required to develop the first crude pencils until they reached the perfection that is found in the new brand of pencils made by A. W. Faber, and known as the "Castell" pencils. These are made in a series of 16 different degrees of hardness, from 6B—a rich, deep black having the color of India ink—to 8H, extremely hard, and suited to the needs of the lithographer for drawing on stone. In these varying degrees the artist, designer, architect or engineer, will find a pencil that is exactly adapted to each particular one of his requirements. And the stenographer, the business and professional man will find the pencil exactly suited to their needs. Many who have for years been familiar with the products of A. W. Faber may not have known that they have an extensive factory in Newark, N.J., devoted exclusively to the manufacture of stationers' rubber goods, where they not only make pencil and ink erasers, but all styles and varieties of rubber bands from the ⅝-inch to the 12-inch heavy parcel band. Each band is guaranteed to stretch six times and is tested to stretch twelves times its length. The firm has been in existence now for 147 years.

The terms upon which Mr. Allan Hazen, of New York, will supervise the construction of the filtration plant have been approved by the Toronto Board of Control. The terms are $18,500, or 2½ per cent. of the total cost; $100 per day for every day devoted to the work of supervising the construction, and $150 per month for an engineer who is to be sent to Toronto by Mr. Hazen.

The crushing strength of individual brick not infrequently reaches the zone of 15,000 to 25,000 pounds per square inch, and of this strength a considerable part is available in a pier, but a still larger proportion might be realized provided an entirely satisfactory mortar could be found.

Prevention of Rust in Steel.

The danger of rust in structural steel in our skeleton-frame buildings is of the utmost importance, says the "Architect, Builder and Contractor." It seems strange that the numberless opinions circulated by the technical press, nearly all in favor of the possibility of preventing rust, and the consequent assurances predicted upon this testimony that it does not quiet this widespread anxiety, but it does not. The spectre will not down, and we question very much if there be any architect or engineer who is wholly at ease on the question.

It is not a question of whether the rusting of steel can be prevented, but whether structural steel, after passing through the exposure, the handling and the multitudinous contingencies embraced in construction, can be made absolutely rust-proof. But the following is good advice. It is a statement from Mr. Gilbreth, a wide-awake and experienced contractor, and is based upon his observations in connection with the dilapidation of a large insurance building that passed through the earthquake and fire in San Francisco:

1. A steel frame, properly painted and buried in masonry, will not rust enough in thirteen years to affect its strength any measurable amount.
2. The better the steel is coated with mortar the less it will rust.
3. Portland cement is better than lime mortar for imbedding steel to prevent it from rusting.
4. Unpainted iron rods buried in mortar composed of lime and a large proportion of Portland cement rust very little, certainly not enough to impair their strength.
5. Columns should be of such cross section that they can be thoroughly imbedded in Portland cement, avoiding a hollow column, unless latticed and filled with very soft concrete.
6. Wherever possible, preference should be given to those shapes of steel that present the least surface to the action of rust.
7. If steel is not thoroughly cleaned from rust before it is painted, the paint will not greatly retard the progress of rust.
8. It is much easier to cover steel thoroughly with concrete than with brick masonry. If brick masonry is to be used, the bricklayer should thoroughly plaster the steel work ahead of the brick work.
9. The quality of the paint used, though important, is not so important as surrounding every part of the steel with Portland cement.
10. Interior columns do not rust as much as exterior columns.
11. Cinder concrete does not injure to the slightest degree a steel floor beam that has been painted.
12. No pipes or wires should ever be placed behind fire-proofing, as they will buckle from the heat and push off the fire-proofing.
13. This building probably could have been saved intact if it had had fire-proof exterior floor and window frames, with wire glass and an emergency water tank on the roof.
14. Terra cotta bricks are not as good as concrete for fire-proofing interior columns, nor do they protect the steel from rusting as well as does Portland cement concrete.
15. Neither marble nor any of the well-known kinds of plaster will withstand heat. There is a tremendous demand for some durable material that can be worked as easily as can wood or plaster, but which will resist great temperature.

Says a western paper: "A carload of brick arrived yesterday, for a walk through the park.

The Benefit of Good Chimneys.

If you own nearby suburban property and contemplate building, see to it that your chimneys are built well, and from the ground up. A properly constructed chimney starts at the ground and should not be less than eight inches in thickness, and lined with either terra cotta pipe or well-burnt clay. Four-inch flues are positively dangerous. It has been estimated that fully 20 per cent. of the fire losses in dwellings throughout the United States are directly traceable to defective flues. The requirements of the New York City Building Code do not countenance carelessness in chimney construction, and those who contemplate building will do well to follow its provisions. A leading authority in writing on chimney construction recently pointed out that it costs but a trifle more to make flue walls eight inches in thickness instead of four, and that after weighing the difference the prospective builder will not only be likely to construct an eight-inch chimney, but will line it as well with some approved fire-resisting material.

Ottawa's Contractor Mayor.

Charles Hopewell, Mayor of Ottawa.

Mr. Charles Hopewell, whose portrait we are pleased to publish herewith, is a well known contractor of Ottawa, who finds time to devote to civic matters as well as to his own business. Mr. Hopewell is well known as one of the most energetic and successful building contractors in Ottawa, and his popularity is well attested by the fact that he was elected mayor by acclamation in a city which is noted for its good mayors and its hard election contests. Mr. Hopewell has been prominent in municipal affairs for several years and was a member of the 1908 Board of Control.

Three thousand miles of sewers were constructed in Montreal during 1908. Nearly nine miles of sidewalks were put down during the same period.

Capt. H. R. Pousette, Sarnia, Ont., has been appointed Canadian Trade Commissioner in Durban, South Africa.

Recent Interesting Legal Cases

Responsibility for Delay.

In the action of Covert v. Janzen upon a building contract an appeal was recently brought by the defendant from the ruling of Judge Lamont in favor of plaintiff, the contractor, to recover the amount alleged to be due for building a business block at Rosthern, Sask., and furnishing the material. The defendant counterclaimed among other things for $25 a day for fifty days by reason of the plantiff's delay in finishing the building. The contention of the defendant was that the building not having been completed within the time provided in the contract, and no application for extension of time having been made or granted, he was entitled to recover the $25 a day provided for in the articles of the contract. The trial judge found that the delay complained of was caused by the defendant in not delivering a quantity of iron on time. The iron was, under the terms of the contract, to be furnished by the plaintiff. Prior to the date of the contract the architect, at the request of the defendant, had ordered the iron which was required. At the time the plaintiff entered into the contract the architect informed him that he had ordered the iron and asked him to accept it as he had so ordered it, to which the plaintiff consented. When the iron came it was consigned to Janzen and the judge found that it arrived too late to allow the building to be completed within the time provided by the contract. The judgment of the trial judge was affirmed and the appeal dismissed with costs.

Notice of Dismissal for City Engineer.

The city of Calgary recently appealed from a judgment of Judge Stuart in favor of Mr. Speakman, formerly city engineer, in an action for salary. The trial judge held that Mr. Speakman was engaged at a yearly salary of $2,500 and, that, having regard to the general standing in the community of the civil engineering profession, a notice short of six months would be unreasonable, whereas the defendants served notice on the 2nd of January to expire on the 31st of the same month. The city contended that the engagement of the plaintiff came under a by-law which enacted that all officers appointed by the Council held their respective offices at the pleasure of the Council, except the mayor, city solicitor, auditors, etc. The trial judge, however, upon considering the duties that presumably fell to a city engineer, held that it could not have been the intention that the terms of the by-law should apply to that official. The appeal against Judge Stuart's decision resulted in the judgment being affirmed, with costs.

A Drainage Case in the Courts.

The drainage appeal case, Henderson et al., Elma Township v. Curtis et al., Wallace Township, was opened recently before Judge Barron, at Listowel. Henry Coughlin, engineer for the Township of Wallace, by requisition from Messrs. Curtis and others, land owners, had laid out a drain and made an award under the Ditches and Watercourses Act, for the purpose of draining lots No. 31, 32, 33, 34 and 35 in the first concession of the Township of Wallace.

It was alleged by the appellants that the natural flow of the waters off the lands was in a north-westerly direction through the Township of Wallace to the north branch of the Maitland River, and that Mr. Coughlin proposed by his drainage scheme to divert the flow of the waters in a southerly direction across the town line, through the lands in the Township of Elma to what is known as the north-east branch of the Maitland River, thereby damaging the lands of the appellants, who also claimed that they had been illegally and excessively assessed for the construction of the proposed drain.

After hearing the evidence of the engineers for both parties, the case was adjourned till the middle of January.

Diversion of a Highway.

In an action brought by the municipality of Delta against the Victoria, Vancouver & Eastern Railway in the British Columbia courts for a mandatory injunction requiring the defendants to restore a certain highway along the Fraser River to its condition prior to the construction of a railway thereon, and for an injunction restraining them from proceeding with any works until they should have diverted the highway and constructed their railway along the existing portions of the highway, as directed by the Dominion Board of Railway Commissioners, Mr. Justice Clement dismissed the case with costs. His Honor held that the action as a suit against public wrong, should have been brought at the instance or suit of the Attorney-General.

New Stationary Engineers' Act.

The Stationary Engineers' Act went into effect in Ontario on the first of January. It applies to all steam plants with a capacity of 50 horse-power or over and to all steam heating plants operating at a pressure of 20 pounds or over. The purpose of this legislation is to prevent the operation of steam plants by engineers who do not hold certificates of competency from the Government. Certificates will be issued only to those who are successful in passing an examination. Provision is made for the issuance of certificates to every engineer who, at the time of the passing of the Act (April, 1907) held a certificate of qualification from any association of stationary engineers in the Province of Ontario, a marine or locomotive engineer's certificate or was actually in charge of a steam plant of 25 horse-power or over in Ontario or who, not being then in charge of such a steam plant, had had at least two years' experience in operation. These certificates continue in force for one year only and require to be re-registered every year. After Jan. 1, 1909, any engineer, not the holder of a certificate, who may be found in charge of a steam plant in Ontario, will be liable to a fine of from $10 to $25; and his employer to a similar fine.

Mr. Isham Randolph, Chicago, one of the engineers whom Toronto engaged as an expert witness in connection with the viaduct, has been appointed by President Roosevelt as one of six engineers to go to the Isthmus of Panama to report for the United States Government on the state of matters in connection with the Panama Canal.

The first iron bridge was built at Salop, England, in 1778, on the line of a railway from Worcester to Shrewsbury. On August 23, 1902, it fell.

Ontario Architects' Convention.

The report of the Registrar of the Ontario Association of Architects which is holding its annual convention at Toronto this week, shows that the present membership amounts to 90, including two honorary members, 48 members in Toronto and 40 in other places. The membership for the last five years has been as folloys: 1905, 64; 1906, 70; 1907, 72; 1908, 84. Examinations were held in April and supplementals in October, and five students passed the first, six passed the second, and four in the final examination. Prizes of architectural books were awarded to Mr. Gillies for general proficiency, and Messrs. Watson and Lawson for design. The Guild Fund Trustees have now on hand a Canada Permanent Company's debenture of $400 at 4 per cent. interest and a savings bank balance of $59.72.

A large deputation from Brantford, Galt and other places on the Grand River waited on Dr. Reaume recently with a request for assistance in making surveys for dams on the grand River, designed to prevent freshets in spring and to furnish power. The natural reservoirs of this river having been destroyed, it now goes on an annual rampage in the spring. The question of damming it has been considered by the Government before now, but the project is one involving large expenditures. As many as four dams might be required, as the river is very long, originating in the north within 18 miles of Georgian Bay.

John Anderson has issued a writ for $20,000 against the city of Calgary for injuries sustained last May while unloading cement at the city storage plant.

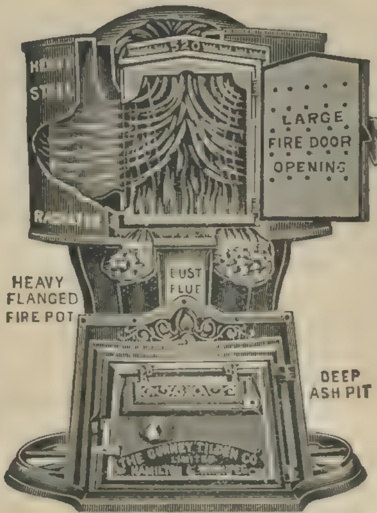
Railway Car Statistics.

The number of railway cars built in Canada and the United States for 1908 and previous years back to 1905 was as follows: 1905, 168,006; 1906, 243,670; 1907, 289,645; 1908, 78,271. Returns from eleven locomotive builders in Canada and the United States show a total of 2,342 engines, about the same relative falling off as in the cars built. Of the 2,124 built in the United States, 1,668 were for domestic use and 456 for export. These figures include 245 electric and 79 compound locomotives The Canadian engines, 218, were all for domestic service. Of these, 20 were compound.

The December issue of the "Studio" contains an interesting article upon recent designs in domestic architecture, in which the work of Mr. P. Morley-Horder, F.R.I.B.A., of Norman Evill and of Messrs. Hubbard and Moore, is discussed. Several attractive illustrations are given. Chapter III. of the series of articles on architectural gardening, by C. E. Mallons, F.R.I.B.A., and F. L. Griggs, is also contained in this issue, and will prove instructive as well as interesting to architects. An interesting illustrated article is also published regarding the prize designs for the Reformation Monument at Geneva.

Mr. George W. Stoddart, a well-known contractor in Bradford, Ont., is in the Toronto General Hospital suffering from a severe double compound fracture of the leg. With another man, Mr Stoddart was working on a scaffold when the platform collapsed. His helper escaped without a scratch, but Mr. Stoddart's leg was so badly injured that at first it was feared that amputation would be necessary.

Repairs and After Cost



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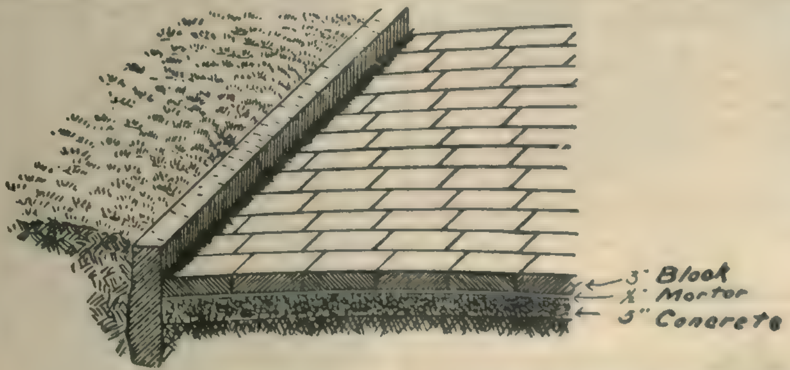

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Steel Outlook Encouraging.

Mr. Frank F. Jones, general manager of the Dominion Iron and Steel Company, in discussing the outlook for the steel plant during the year 1909, said that it could not be more encouraging. Orders for rails are coming in from all over the world, and while he could not give particulars at the present time, he could say that the company was likely to receive orders within the next three months that would prove a revelation to the Canadian steel industry.

The plant at Sydney, according to Mr. Jones, is in a position to furnish steel to the world's markets at $6 a ton less than Pittsburg on account of the fact that the cost of assembling the raw materials at Pittsburg is at the lowest estimate $3.25 per ton, to which must be added the cost of conveying the manufactured iron to the seaboard, namely, $2 per ton, while the cost of assemblage at Sydney, which is on the seaboard, and one thousand miles nearer to the great markets, is given at 80 cents per ton, the difference in favor of Sydney being calculated at $6 per ton as stated.

Extensive Bridge Construction.

An idea of what the bridge-building of a transcontinental railway involves may be obtained from the official statement that there are 5,935 bridges on the C.P.R., whose combined length is 81.55 miles.

As many as 44 new bridges were erected last year or are in process of completion between Montreal and Quebec. Since the building of the road the weight of engines has increased vastly. Within the past year the standard has been raised from 337,000 to 355,000 pounds.

The old bridges could not have carried engines of such weight with safety. The whole bridge work of this section is being replaced by other structures of a more substantial character.

When all this work is completed there will be an enormous saving in running expenses. One of the new engines will be able to take a train load that formerly needed two engines and two crews.

The replacing of underbridges by steel structures has been going on on all sections of the line. The largest of all is a bridge over the Belly River, about half a mile from Lethbridge, in Southern Alberta. It forms part of a new loop replacing a section which includes four shorter crossings. The new bridge, which will take the place of the four, is nearly a mile long, and for two-thirds of its length it is three hundred feet high—a combination of height and length that is rarely matched. It weighs 12,000 tons, over the foundations of the pier and the permanent water line.

Vibration, the result of shaking in a "rattler," increases the strength of soft cast iron 10 to 15 per cent

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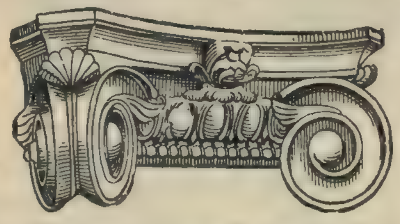

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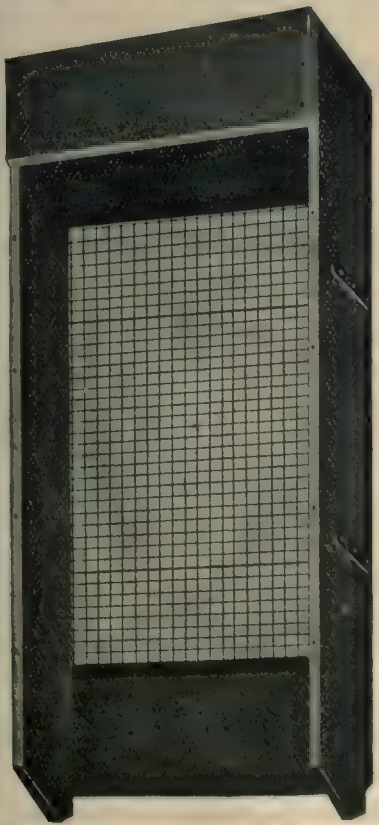

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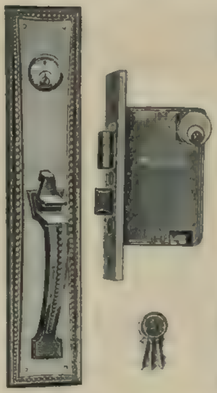

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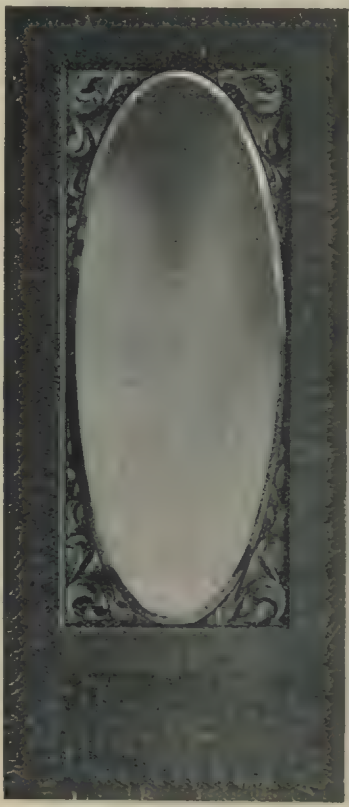

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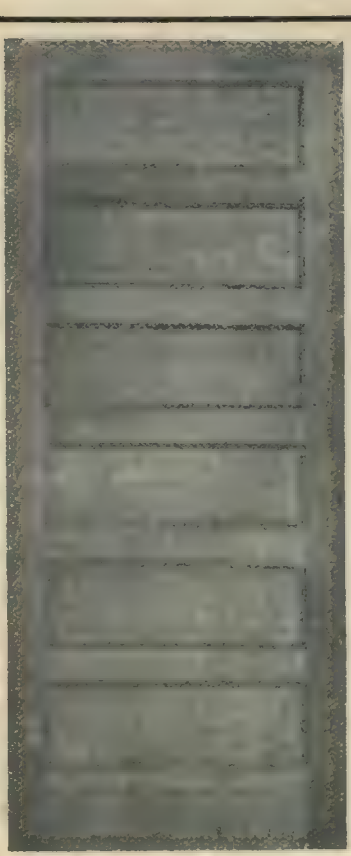

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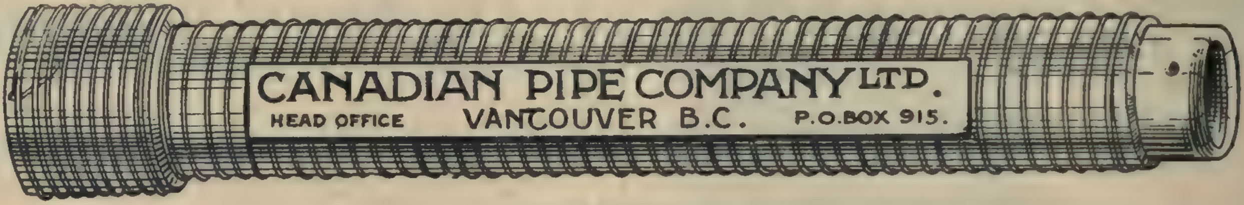
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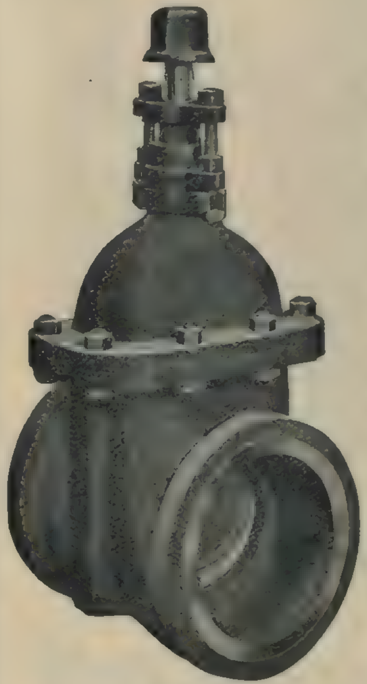

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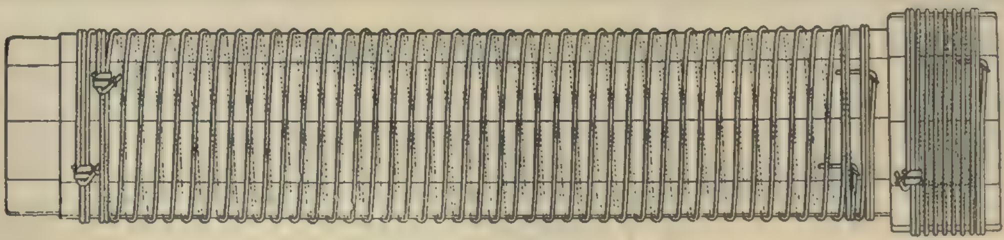

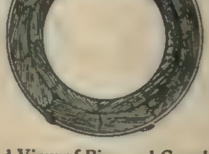

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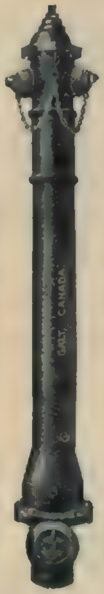

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Clinton, Ont.
Work is to be commenced at once on a system of waterworks. An engineer will shortly be appointed and contracts awarded.

Oakville, Ont.
The tenders opened on January 6 for intake pipe for the water works have been rejected, and the work will be done by day labor. Willis Chipman, Toronto, is consulting engineer.

Renfrew, Ont.
Tenders are being taken for the purchase of the proposed $5,000 sewer bonds. Engineer, John R. Stewart, Renfrew.

St. Catharines, Ont.
Tenders close January 20th with D. Benzie, City Engineer, for the construction of a sewer on Lake street.

St. Thomas, Ont.
Tenders will probably be received about April 1 for the proposed septic tanks for city sewage, for which the citizens on January 4 voted to issue $40,000 bonds. Jas. A. Bell, City Engineer; W. B. Doherty, City Clerk.

Toronto, Ont.
Tenders addressed to Joseph Oliver, Chairman, Board of Control, will be received until February 2nd for the construction of section No. 3 of the high level intercepting sewer, tenders to be alternative for brick and concrete. The work required is as follows: 1,972 lineal feet of 7 foot 6 inch circular sewer; 2,419 lineal feet of 7 foot 9 inch circular sewer; 1,556 lineal feet of 8 foot circular sewer; 439 lineal feet of 8 foot 6 inch circular sewer, together with manholes, connections, etc. Plans and specifications may be obtained at the office of City Engineer Rust.

Vancouver, B.C.
Tenders for the supply of brass work, galvanized iron pipe and lead pipe, required by the city for the year 1909, will be received until February 10th by W. McQueen, City Clerk. Specifications may be obtained at the waterworks office, City Hall, Vancouver.

Weston, Ont.
J. H. Taylor, City Clerk, states that an election will probably soon be held to vote on the question of constructing water works. Engineer, Willis Chipman, 103 Bay street, Toronto.

Winnipeg, Man.
Tenders for sewer construction in Aberdeen avenue and Prince street closed January 15th with M. Peterson, Secretary, Board of Control.

AWARDED.

Montreal, Que.
The Water Committee have awarded the contract for a steel flume, with a sluice gate, to the John McDougall Company for $1,639. The two large sluice gates, about nine feet in diameter, for the new water conduit were given to the Coffin Valve Company, of Boston, for $2,556. Both tenders were the lowest. Some thirty-inch and thirty-six-inch gate valves were divided up between Drummond, McCall & Company and the Canadian Fairbanks Company.

Winnipeg, Man.
The tender of Bissett & Louchs for the supply of 543 tons of water pipe at $38.59½ a ton has been accepted by the Board of Control.

Railroads, Bridges and Wharves

Alberni, B.C.
Tenders will shortly be taken for the grading of the mountain section of the Alberni extension of the E. & N. Railway.

Auburn, Ont.
Tenders will be received by D. Patterson, Commissioner Huron County, Auburn, until January 25 for constructing the superstructures of two steel bridges.

Calgary, Alta.
A report from this city states that a progressive campaign of railway building in Southern Alberta is being arranged for the present year. A party of surveyors is now working in the vicinity of Pincher Creek and the lines proposed will keep them busy for three months. In connection with the roads which are to run northeast from Calgary to Saskatoon and other points in the Saskatchewan Valley, the amount mentioned for the guarantee of bonds is $10,000 per mile.

Amherst, Ont.

Collingwood, Ont.
The plans of the Collingwood Shipbuilding Company, who have purchased from the town an additional waterfront of ten acres, include the construction of two new dry docks, one 400 feet in length and the other 705 feet in length. The former is already being built and will be ready for operation early next season. The other dock will be commenced immediately.

Edmonton, Alta.
General Manager McLeod, of the C. N. R., was recently in the city and stated that his company would at once commence the railway extensions into Alberta if the Government guarantee their bonds. The C. N. R. surveyors are working out north on the line to Athabasca Landing and also west to the Pacific coast. It is probably that the line will be extended to the Brazilau coal fields this year. It is stated in Winnipeg that the recent conference between western politicians and Mackenzie & Mann, of the C. N. R., will result in the fulfilment of the various projects. The bonds it is understood have been guaranteed to the extent of $15,000 a mile.

Fredericton, N.B.
Information has reached the Department of Public Works to the effect that thirty spans of the Perry Point bridge were carried away by the recent flood. The structure was three-quarters of a mile long and was in course of repair. It originally cost $80,000.

Fort Erie, Ont.
Application is being made for the incorporation of the Fort Erie & Buffalo Bridge Company, with power to construct a general traffic highway bridge across the Niagara River.

Laprairie, Que.
Tenders addressed to F. C. Larose, Secretary Treasurer, will be received until January 29th for the erection of an iron bridge over the river St. Jacques, according to plans and specifications which may be seen at the Secretary's office here.

New River Mills, N.B.
The wooden highway bridge, 60 foot span, has been carried away. Hon. John Morrissy is Chief Commissioner, Department of Public Works, Fredericton, N.B.

Ottawa, Ont.
The Cobalt Range Railway Company will apply to Parliament for authority to extend its proposed line from Haileybury to Elk Lake, and thence to Opasilica Lake, and on to the National Transcontinental.

Owen Sound, Ont.
A report is current that Mr. W. P. Telford, ex-M.P., is endeavoring to interest a large American ship-building concern in a project for the erection of a modern dock here. The undertaking would include the erection of a large shipbuilding plant. The total cost has been estimated at $500,000.

Quebec, Que.
The Harbor Commissioners are considering extensive improvements to the port of Quebec. Among the projects contemplated are the installation of steam cranes on the embankment, the paving of the cross wall, the supply of water to all the wharves and an increase of the storage resources.

Sherbrooke, Que.
The Delaware & Hudson Railroad propose running a branch into this city from its Montreal line.

St. John, N. B.
Plans will be prepared by F. W. Holt for the construction of a new bridge across the harbor. It is hoped to have them completed in readiness for submission to the legislature at the coming sessions.

Toronto, Ont.
The Abitibi & Hudson Bay Railway Company are applying to Parliament for an act extending the time for the construction of their railroad.

The Toronto, Niagara & Western Railway Company are applying to Parliament for an act extending the time for the commencement and completion of the railways of the company, viz.: Toronto to Niagara Falls, Toronto to Windsor, St. Catharines to Port Colborne, also for increasing the bond issue.

Vancouver, B.C.
The C. P. R. estimates provide for the erection of a large addition to the C. P. R. depot in this city. The plans call for an addition practically as large as the present building.

In connection with the appropriations for the Canadian Pacific Railroad work on the Pacific division during the coming summer, Mr. H. J. Cambie, consulting engineer of the company, states that one of the principal items in the estimates is for the construction of steel bridges along the main line and on some of the branches in the interior. The expenditure on this division on account of these bridge projects will be very large.

Victoria, B.C.
It is understood that the C. P. R. will replace several of the wooden trestles between this city and Shawinigan Lake by steel structures.

Application will be made by the Kettle River Valley Railway Company for incorporation to operate a line of railway from Midway to Penticton, a distance of about 120 miles, and from Penticton to Nicola, a distance of about 150 miles.

A company is seeking authority to construct a line from Lena Island along the valley of the Honna river to Camp Robertson and Camp Wilson, and from thence to a point on Shields' Island, Rennell Sound, etc., with power to construct branch lines not to exceed twelve miles in length.

The Pacific Northern & Omineca Railway are applying to the legislature for amendments to their charter giving the company power to construct and operate a line of railway from the junction of the Bulkley and Telkway rivers and providing for the extension of certain time limits.

The legislature will be asked to grant a charter to a company for the construction of a line from a point near the international boundary in East Kootenay to a point on the boundary line between British Columbia and Alberta, with power to construct branch lines not to exceed ten miles in length.

Winnipeg, Man.
The Great Northern Railway is advertising in the Manitoba Gazette certain applications for charters and incorporations, which indicate that the company is preparing to begin active construction in Manitoba to connect up the scattered links of its future system. The road is supposed to be in Winnipeg by midsummer next. The Northern Pacific will be associated with the Great Northern in the enterprises.

AWARDED.

Campobello, N. B.
E. R. Reid has the contract for a wharf, 314 feet long, with pier head 60 feet by 40 feet.

Fredericton, N. B.
The contract for the construction of the Brown's Flats high water wharf has been awarded to G. W. & B. R. Tanna, of Kars.

Grand Manan, N. B.
J. E. Gaskill and L. F. Fosert have obtained the contract for the construction of a wharf, 200 feet long, with pier head, 40 feet by 30 feet.

Lorneville, N. B.
The contract for a breakwater and wharf 400 feet long, has been awarded to J. E. Kane, of Carleton, N. B. Mr. Kane has also obtained the contract for the construction of a pile wharf, 360 feet long, with a pier head, 60 feet by 40 feet, at Beaver Harbor.

Quaco, N. B.
T. P. Charleson, Ottawa, Ont., has been awarded the contract for an extension of 300 feet to the east pier at this place.

Sussex, N. B.
A. E. Smye has been awarded the contract for the construction of the MacFarlane bridge at this place.

Public Buildings, Churches, Schools, etc.

Dundas, Ont.
It is stated that the erection of a new post office building here this season is now secured. According to Mr. Hunter, of the Public Works Department, Ottawa, who was recently in town, the cost of the building will be between $35,000 and $45,000. The question of a site is now under consideration.

Edmonton, Alta.
Funds are to be raised for the erection of a new hospital in the west end. The amount required is $150,000, and of this sum $60,000 is still needed. G. H. Adams is secretary of the movement.

Estevan, Sask.
The School Board are considering the erection of a new school building. A. E. McKay is Secretary of the Board.

Halifax, N.S.
Tenders closed February 10th with W. L. Brown, City Treasurer, for the whole or part loan of the sum of $105,600 for the purpose of building and equipping public schools.

Herbert E. Gates, architect, this city, is preparing plans for a large brick and stone addition to the building of the Ladies of the Sacred Heart. Tenders will be called about January 25th.

London, Ont.
An offer of $5,000 towards the erection of an Inebriates' Home has been received by License Inspector Galpin, who is endeavoring to obtain a substantial grant from the Government.

Montreal, Que.
The M. A. A. contemplate the erection of a new clubhouse this season.

Authority will be sought by the Catholic School Commissioners to raise the sum of $150,000 for new school buildings.

The Royal Arthur School was badly damaged by fire on January 18th. The western portion of the building was almost totally destroyed.

The Protestant School Commissioners are applying to the Provincial Legislature for authority to issue additional debentures to the amount of $250,000 for the purchase of school sites and the erection of school buildings.

Newcastle, N.B.
Tenders closed January 18th with J. E. T. Lindon, Secretary, for the issue of $40,000 five per cent 30-year school bonds of this town.

Newport, Que.
The Roman Catholic Church in this town was destroyed by fire at heavy loss. Rev. Father St. Lawrence is in charge of the parish.

New Westminster, B.C.
Plans have been prepared for the erection of a new Masonic Temple on Agnes street to cost approximately $20,000.

Niagara Falls, Ont.
A site is being selected for the proposed new south firehall.

Ottawa, Ont.
The East View Public School Board are contemplating several improvements to their building.

A meeting of the Ottawa Valley Medical Association was recently held to discuss plans for the erection of a Tuberculosis Sanatorium for the counties of Lanark, Renfrew and Carleton.

The authorities are still considering various sites for the erection of the proposed tuberculosis hospital. It is hoped that this matter will be settled so as to permit of the commencement of construction early in the spring.

Port Essington, B.C.
It has been decided to rebuild St. John's Anglican Church, which was recently destroyed by fire at a loss of $3,000.

Quebec, Que.
Tenders will be received until January 26 by Mr. H. T. Machin, Assistant Provincial Treasurer, for the purchase of $750,000 debentures of the Province of Quebec, issued in connection with the erection of a new jail in the district of Quebec.

Renfrew, Ont.
The Baptist Church was considerably damaged by fire on January 18th.

Toronto, Ont.
The directors of the Western Hospital are stated to have accepted plans of E. J. Lennox for the new hospital building. Estimated cost $50,000.

The Christian Brothers are stated to be negotiating for the purchase of a large property on the Kingston road, near St. John's Church, Norway. The site is wanted for the erection of a novitiate.

Vancouver, B. C.
A permit has been granted for the erection of the new fire hall to be built on Charles street at a cost of $6,920.

The school authorities have received a recommendation for additional High School accommodation from Mr. Argue, Superintendent of City Schools.

It is stated that the Great Northern will submit plans to the City Council early this year for the erection of large terminals, to cost more than $3,000,000.

Winnipeg, Man.
Plans are stated to be in preparation for the large new building for the Winnipeg Horse Show Association. Negotiations for the purchase of a central site are said to be in progress.

The Manitoba Agricultural College have decided to establish a domestic science department and erect a new building therefor. S. Hooper, the Provincial Architect, will prepare plans.

Residences

Brandon, Man.
Arrangements are reported to have been practically completed for the erection of a large residential block in this city. A. H. Bartlett, Brandon, may be addressed.

Kemptville, Ont.
W. F. Ritchie's residence at this place was destroyed by fire last week, together with the offices of the Weekly Advance.

Toronto, Ont.
Mr. J. C. Eaton has purchased the large

property formerly belonging to Mrs. Arthurs, between the Austin estate and the Nordheimer estate, upon which he will erect a large residence, plans for which are stated to be almost completed.

Recent building permits include: R. C. Bustard, 2 1-2 storey brick dwelling, Rowanwood avenue, $5,000; J. S. Case, two detached 2 1-2 storey brick dwellings, Roncesvalles avenue, $8,000; Deeth & Sons, one pair semi-detached 2 storey brick dwellings, Fisher street, $4,000; Deeth & Sons, two pair semi-detached 2 1-2 storey brick dwellings, Dufferin street, $9,000; John Coulton, pair semi-detached 2 storey roughcast dwellings, Jones avenue, $2,000; Mrs. Bryant, pair semi-detached 2 storey and attic brick dwellings, corner of Fernbank and Bartlett avenues, $6,000; E. Smith, 2 storey brick dwelling, Lynd avenue, $2,500; W. Rame, 2 1-2 storey brick dwelling, Langley avenue, $3,700; B. Pears, 3 attached 2 storey brick dwellings, Pears avenue, $6,00; W. E. and G. A. Mackay, pair semi-detached 2 storey brick dwellings, Galley avenue, $4,000; J. Thompson, 2 storey and attic brick dwelling, Marlboro' avenue, De Lisle street, $4,500; G. Brady & Son, pair semi-detached 2 storey brick dwellings, Sorauren, Galley avenue, $4,200; James Ince, 2 1-2 storey brick dwelling, corner Heath street and Dunvegan avenue, $10,000; T. W. Murray, 2 storey and attic brick dwelling, Indian road, $4,500; Robert C. Bustard, 2 1-2 storey brick dwelling, Rowanwood avenue, $5,000; J. S. Laxton, 2 1-2 storey brick dwelling, Sorauren avenue, $2,500; W. H. T. Stevens, 3 pair semi-detached 2 1-2 storey brick dwellings, Delaware avenue, $10,000; J. McGonegal, 2 storey brick dwelling, Bain avenue, $2,500; Farrell & Ford, 3 pair attached 2 1-2 storey roughcast dwellings, Franklin avenue, $5,200; W. E. Lowe, 2 storey brick addition to dwelling, corner of Paton road and St. Clarens avenue, $1,800.

Victoria, B.C.

Recent building permits include W. D. McGregor, dwelling, Southgate street, $1,900; A. H. Mitchell, dwelling, Fernwood road, $2,400; A. Cox, dwelling, Government street, $1,900; W. Dunford & Son, dwelling, Dunedin street, $1,800.

Business Buildings and Industrial Plants

Amherstburg, Ont.

An almost inexhaustible supply of silica is stated to have been discovered here. This will possibly lead to the establishment of a glass factory.

Brantford, Ont.

The box factory owned by W. J. Hampel was destroyed by fire last week at a loss of $10,000.

Cranbrook, B.C.

The Imperial Bank of Canada will put up a substantial building in the spring.

Elk City, Ont.

It is stated that a four storey hotel building, electric lighted, steam heated and with a private waterworks and sewerage system, will be constructed here immediately.

Fort William, Ont.

The excavation of the new G. T. P. elevator at Fort William is well under way and plans for the structure are in preparation. The Canadian Bridge Company, Walkerville, which has the steel contract, is ready to begin its part of the work when the spring opens.

Kingston, Ont.

The Gould broom factory, owned by the Street Railway Company, was destroyed by fire at a loss of from $10,000 to $15,000.

Melfort, Sask.

The Star City hotel, owned by Wm. Stenhouse, was recently destroyed by fire at a loss of about $2,500.

London, Ont.

The factory of the Globe Casket Company was destroyed by fire on January 19th at heavy loss.

Montreal, Que.

The buildings of G. H. Gravel, Poirier Bros., A. Ram and others were damaged by fire last week at considerable loss.

The rumor is current that a new hotel will be erected on the corner of St. Catherine and St. Alexander streets upon property recently acquired by Mr. Robert Reid.

The shops of the G. T. R. at Point St. Charles were destroyed by fire last week at considerable loss.

Niagara Falls, Ont.

The Parkside Inn was recently damaged by fire to the extent of $15,000.

Paris, Ont.

The Harold Sanderson refrigerator factory, which was recently destroyed by fire, will be rebuilt on a larger scale.

Port Essington, B.C.

T. R. Brigham, Vancouver, will erect a large saw mill at this place.

Sherbrooke, Que.

Gregoire & Audet, architects, this city, have prepared plans for the erection of a stone and brick store for H. C. Wilson & Sons. Estimated cost $20,000.

Sydney, C.B.

There is a probability of the Dominion Iron & Steel Company enlarging its operations by manufacturing lime and the various by-products of its iron plant.

Taber, Alta.

The buildings of W. W. Douglas and others at this place were destroyed by fire last week at a loss of about $6,000.

Toronto, Ont.

The building of the Rolston Electric Laundry on Adelaide street west was recently damaged by fire at a total loss of about $5,000.

A. Snider has obtained a permit for a two storey brick store and dwelling and stable corner of College street and Ronscesvalles avenue to cost $3,500.

J. C. Wilger will erect a pair of semi-detached two storey brick stores and dwellings on Queen street east at a cost of $4,000.

A permit has been issued to F. Sharp for the erection of a pair of semi-detached two storey brick stores on Queen street east at a cost of $4,000.

The Toronto Street Railway will erect new car barns, 350 feet by 100 feet, brick and concrete construction, on Lansdowne avenue.

Vancouver, B.C.

The Godson Block, which it is proposed to erect on Beatty street, will be 50 feet by 120 feet and will cost $150,000.

Another projected building is the Fuller block, the location of which has not yet been decided. This structure will be three storeys high and will cost about $15,000.

A. Filion is contemplating the addition of two storeys and an extension to his brick store on Carroll street at an estimated cost of $15,000.

J. J. Banfield will erect a three storey and roughcast basement building, of brick and stone, corner of Bute and Melville streets. The structure will be for stores below and rooming apartments above. The cost is estimated at $20,000.

A three storey block is contemplated by Gorden & Campbell, to be erected at the corner of Dunsmuir and Hornby streets for stores and apartments. The estimated cost is $25,000.

A three storey hotel building will probably be erected on Granville street by Douglas & Thorley at a cost of $20,000.

Plans have been completed for the new Bauser Hotel, to be erected at the corner of Howe and Hastings streets. The structure will be 78 feet by 120 feet, seven stories high, of fireproof steel and concrete construction. Estimated cost $150,000.

The Vancouver Horse Show Association have obtained a permit for the erection of a riding academy on Georgia street at a cost of $45,000.

A permit has been granted to the National Finance Company for the erection of a brick block on Westminster avenue; estimated cost, $30,000.

Winnipeg, Man.

The plant of the James Ballantyne Company, Limited, plumbing contractors, was destroyed by fire recently at a loss of $10,000. The building was owned by Mr. Jas. Ballantyne, of Montreal.

The Grand Trunk Railway are stated to be preparing plans for the erection of several concrete elevators along their system.

The Great West Life Assurance Company have acquired property corner of Lombard and Rorie streets, where it is stated they will erect a building at a cost of $150,000.

Power Plants, Electricity and Telephones

Belleville, Ont.

The Interurban Railway have made an application to the Provincial Government for an extension of time for the commencement and completion of their projected lines in this district.

Brantford, Ont.

Arrangements are being made by the Lyons Electric Company to install a storage battery in its plant. Later on the company expects to duplicate its plant.

Calgary, Alta.

Mayor Jamieson and City Commissioners Clarke and Graves have been investigating the cost of the installation of an electric street railway with C. E. Taylor, Superintendent of the Edmonton Street Railway, and C. S. Wright, of the Preston Car Company, Preston, Ont. It is stated that the citizens would have to vote an additional $100,000 to secure the system.

Edmonton, Alta.

An important power scheme is now being considered by the city. It is proposed to use the water power at Grand Rapids on the Athabasca river, 150 miles northwest of the city, to generate electricity for the use of the city. At Grand Rapids there is a fall in the water of 140 feet in a distance of 600 feet, where the engineers figure that they could obtain electric power to the extent of 250,000 horse-power, which would meet the needs of Edmonton, Strathcona, Fort Saskatchewan, Leduc, Wetaskiwin and other towns. At the present time the above mentioned towns use 15,000 h.p. It is estimated that it would cost $1,500 a mile to build a conducting line for the 150 miles.

Morrisburg, Ont.
The Morrisburg Electric Railway are applying for an amendment to authorize the construction of an extension of the main line from Ormond to Ottawa, passing through Ormond, Metcalfe and Greeley.

Saskatoon, Sask.
Tenders are invited until February 3rd by J. H. Trusdale, City Clerk, for 500 h.p. boilers in two or three units. Plans and specifications may be seen at office of Electrical Superintendent.

Wellandport, Ont.
James A. Ross, president of the Dunnville, Wellandport & Beamsville Electric Railway, states that plans have been made to begin construction this spring. The road will extend from Dunnville through Wellandport to Beamsville, a distance of 23 miles. A bylaw has been recently passed by Dunnville granting a bonus of $15,000. It is possible that the board of directors will be reorganized shortly. Capital stock, $400,000. The road will be bonded at $20,000 per mile. Officers: James A. Ross, Wellandport, president; W. J. Aikens, Dunnville, secretary; R. T. Gough, Toronto, chief engineer.

Wolseley, Sask.
The ratepayers will vote January 30th to issue $18,000 five and a half per cent. 15-year debentures as a loan to the Central Light & Power Company. J. A. Hill, Secretary-Treasurer.

AWARDED.

Glencoe, Ont.
The municipal council is reported to have awarded to the Colonial Engineering Company of Montreal, Que., the contract for the erection of a gas producer plant of 96 horse-power.

Miscellaneous

Estevan, Sask.
The Town Council are contemplating improvements to the drainage system.

Gananoque, Ont.
Tenders are invited by S. McCammon, Town Clerk, until February 2nd for the purchase of $19,621 five per cent. 20-year local improvement debentures.

Hamilton, Ont.
Tenders addressed to S. H. Kent, City Clerk, will be received up to January 20th for supplying and driving piles at the proposed extension of the Ferguson avenue and Catherine street sewers, to and through the revetment wall. Plans and specifications at office of the City Engineer.

Notre Dame de Grace, Que.
Tenders for the purchase of $50,000 four and a half per cent. 40-year debentures addressed to L. Des Carries, Secretary-Treasurer, will be received until February 1st.

Ottawa, Ont.
It is stated that the dredging of the Carp river will be commenced at the earliest possible date this season. The scheme is the largest drainage project ever undertaken by the county and will begin a short distance from Hazeldean, Ont., and extend nearly twelve miles to about a mile and a half west of the village of Carp. The estimated cost is $28,000.

Portage la Prairie, Man.
Tenders for the construction and placing of a removable needle dam and bulkhead in the Assiniboine river, for the improvement of Crescent Lake, close January 20th with W. R. Grieve, Secretary, Parks Board. Plans and specifications at office of Parks Board, this city, and at the office of Smith, Kerry & Chace, Consulting Engineers, Carnegie Library Building, Winnipeg.

Toronto, Ont.
The time for receiving tenders for the construction of a hydraulic dredge for the city has been extended from January 19th to February 2nd. Specifications at office of City Engineer Rust.

AWARDED.

Colchester Tp., Ont.
$8,354 debentures of this township, issued for drainage purposes, have been awarded to G. A. Stimson & Company, Toronto.

St. John, N.B.
The Finance Committee of the School Trustees have awarded to J. M. Robinson & Sons, of this city, the $78,500 bond issue. Their offer, with accrued interest to date, in each case was 97 for $9,500 forty-year issue; 98 for $9,500 twenty-five-year issue, and the same figure for $6,500 twenty-five-year issue. The figure for $53,000 twenty-five-year issue is 104.16. The other tenders were from Hanson Bros., Montreal, $76,980, with accrued interest to date for whole issue of $78,500; Dominion Securities Corporation, Montreal, 104.07, with interest, for $53,000 issue, and 97.36, with interest for balance; R. G. Duncan, Bathurst, 98 for $40,000 of the 4 1-2 per cent. issue; J. C. McIntosh & Company, Halifax, 95 qtr., with interest, for the $9,500 4 per cent., and 96 qtr. for $16,000 of remainder; Royal Securities Corporation, 103.86, and interest, for $53,000 issue, and 96.55 for balance; W. C. Bent, Toronto, lump sum of $80,311 for whole issue of $78,500; Wood, Gundy & Company, Toronto, $79,900 for whole issue of $79,500; Aemilius Jarvis & Company, Toronto, $79,308.55 for whole issue of $78,500.

BUSINESS NOTES.

A. Simard & Company, Abervalle, Que., have assigned.

Gingras & Nadeau, plumbers, Levis, Que., have dissolved partnership.

Wickett Bros., builders, Toronto, Ont., have dissolved partnership.

Dissette & Dean, builders and contractors, Vancouver, B.C., have registered.

T. P. Whitlam & Son, builders, Toronto, Ont., have assigned to J. P. Langley. Creditors met January 19th.

The assets of A. Bouchard & Company, builders and contractors, Montreal, Que., will be sold on the 25th inst.

M. J. Creham has been appointed official liquidator of the National Construction Company, Limited, Vancouver.

The Electric Repair & Contracting Company, G. E. Matthews and C. G. Matthews, Montreal, Que., have registered.

A winding up order has been given against the Colonial Portland Cement Company, of Wiarton, Ont. The company assigned recently to Mr. E. R. C. Clarkson, who was appointed provisional liquidator.

NOTES.

The spending of $5,000,000 on improving and extending the Algoma Central is said to be the intention of those behind the Lake Superior Corporation.

Victoria, B.C., has secured $1,200,000 with which to instal a new water system. It is proposed to lay pipes from Sooke Lake, 15 miles from the city. It will take two years to carry out the project.

At the recent inaugural meeting of the Brantford City Council the Mayor laid down a heavy programme, embracing market improvement, new civic and Government buildings, street paving, securing new industries, improved railway facilities, the power question and a new collegiate building.

The Guelph waterworks commissioners have handed over to the municipality a cheque for $17,000, which is a part of the earnings for 1908. At a cost of $125,000, an almost entirely new system of waterworks will be completed in a few days. It includes an addition to the pumping house, with two new powerful pumps and a 24-inch pipe line laid to a number of springs five miles out. A concrete reservoir, with a capacity of half a million gallons and a hundred foot standpipe of the same capacity, on the highest elevation in the city, are also features of the new system.

James Peat & Sons, drilling contractors of Petrolea, recently completed an eight-inch water well at London, Ont., and were successful in securing an excellent supply, which being tested pumped close on to 200,000 gallons in twelve hours. The water when analyzed was found to be purer than the spring water used by the city and very much softer. The well was put down by a number of prominent citizens, including the Hon. Adam Beck, to prove to the Water Commissioners that the much-needed addition to the present water supply could be easily and cheaply secured from artesian wells. As a result of the success with this well, the water bylaw to spend $441.000 on extending the present spring water system was recently defeated by the citizens. The contractors have since been instructed to proceed immediately to drill a 12-inch well in the same neighborhood.

The new Redwood bridge, Winnipeg's latest addition to the city's traffic bridges, and the most pretentious structure yet erected by the western metropolis, was recently opened to the public. The Dominion Bridge Company had the contract for the steel superstructure, and with the excellent facilities at their disposal have made a record for rapid construction in their erection of the spans. They started laying the steel last summer, and despite the unfavorable weather of this winter have rushed the work through. The bridge is 655 feet over all, with 25 feet of clear roadway. The floor of this is laid with six inches of concrete, reinforced with steel rods, and it carries two car tracks. On either side are foot paths, siz feet in width, proteced with heavy hand rails. The bridge is of the through truss type, and contains in all 700 tons of steel. It has a draw span 250 feet in length, operated on a central pier by electric drive; two spans of 150 feet each, and a short intermediate span of 98 feet. The piers are of concrete on spruce piling driven to a solid foundation, and are fitted with ice breakers on the up-stream side. The deck of the bridge is 29 to 30 feet above average high water mark, giving ample clearance in flood time. The approaches at either end have been completed and the roadways built.

Tenders and For Sale Department

Agent Wanted

or the best line of Concrete Machinery in the world. A splendid opportunity for an aggressive young firm or individual. Box 136, CONTRACT RECORD, Toronto. tf

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City of Brantford

Sewer Construction

Sealed tenders addressed to John Moffat, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock noon on

Thursday, February 11th, 1909,

for the furnishing and laying of about 2,250 feet of 12 inch extra strength Sewer Pipe and 635 feet of 12 inch Cast Iron Pipe, together with 11 manholes; greatest cut 32 feet; average cut 17½ feet.

Plans and specifications may be seen and instructions to bidders, and forms of tender obtained at the City Engineer's Office.

Each tender must be accompanied by a marked cheque for 5 per cent of the amount of the tender.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.

City Engineer's Office,
Brantford, January 18th, 1909. 5

Tenders for Bridge

Tenders will be received by the undersigned up to 12 o'clock noon, on TUESDAY, THE 26TH DAY OF JANUARY, 1909, for the erection of a Steel Bridge over the Saugeen River at a point about 2½ miles East of Port Elgin. Bridge is about 300 feet long. Cement pier in centre to be built, the abutments are nowerected. Plans may be seen at office of County Clerk at Walkerton, or tenderers may submit their own plans and specifications, Deposit of ten per cent. to accompany each tender which will be returned it tender not accepted. The lowest or any tender not necessarily accepted

Dated this 29th day of December, 1909,

P. A. MALCOMSON,
County Clerk, Walkerton, Ont.
4

City of Regina

Tenders for
Regina General Hospital

The undersigned will receive sealed tenders on behalf of the Corporation of the City o Regina, marked "Tender for Regina General Hospital" up till five o'clock p.m., on MONDAY, 1ST FEBRUARY, 1909, for the construction of the new Regina General Hospital, according to plans and specifications prepared by Meyer J. Sturm, Architect, 84 La Salle St., Chicago, U.S.A., which may be seen at the office of the City Clerk, Regina, as well as at the Builders' Exchange, Winnipeg.

Each tender to be accompanied by a certified cheque drawn upon any chartered bank of Canada payable to the order of the "City of Regina" to the extent of $5,000.00, which will be forfeited should the contractor fail to enter into a satisfactory contract when notified to do so, and which will be returned to the unsuccessful bidders when the contract is signed.

The contractor whose tender is accepted will be required to furnish a bond for $25,000.00 by a Canadian or British Guarantee Company.

The City Council reserve the right to reject any or all tenders, and to waive any defects or irregularities therein.

A deposit of $10.00 must accompany any application to remove plans snd specifications from the City Clerk's office and such privilege will only be granted to bona fide contractors for the entire work.

J. KELSO HUNTER,
City Clerk.

Regina, Sask., 28th December, 1908. 4

Debentures for Sale

The town of Gananoque has issued Local Improvement Debentures for $19,621, to fall due on January 1, 1929, and bearing interest from January 1, 1909, at the rate of 5 per cent. per annum, payable at the Treasurer's office in Gananoque on January 1 in each year. First interest payment January 1, 1910.

Tenders for the above debentures addressed to the undersigned will be received until TUESDAY, FEBRUARY 2, 1909.

For further information address

S. McCAMMON, Town Clerk.

Gananoque, January 14, 1909. 4

City of Lethbridge, Alberta, Canada

Tenders for

Municipal Power Plant

Specifications, drawings and form of tender may be obtained from the Secretary-Treasurer, City of Lethbridge, Alberta, on and after the FIFTEENTH DAY OF JANUARY, 1909. The following are the sections issued:

A. Boilers and Accessories.
B. Economizer.
C. Feed Pumps.
D. Mechanical Draft.
E. Pipe Work and Valves.
F. Steam Turbine Generator.
G. Steam Engine Generator.
H. Re-erection of Steam Engine.
I. Condensing Sets.
J. Crane.
K. Switchboards, &c.
L. Motor Generators and Transformers.
M. Buildings, Steel Work, Etc.

Tenders on any or all of the above sections or any combination of the above sections will be received.

Tenders to be enclosed in a sealed envelope addressed "Tenders for Electric Plant" and to be delivered to the undersigned at the City Hall, Lethbridge, on or before the 1st day of March 1909, and to remain open for acceptance for two (2) calendar months from that date.

Each tender must be accompanied by a certified cheque payable to the Secretary-Treasurer, of the City of Lethbridge, for 10% (ten per cent.) of the amount of the tender, which will be returned to the tenderer, unless he fail to enter into contract for the work at the rate stated in the tender.

Plans and specifications may also be seen at the offices of Messrs. Smith, Kerry & Chace, Confederation Life Building, Toronto. Ontario, and the Carnegie Public Library Building, Winnipeg, Manitoba. The lowest or any tender not necessarily accepted.

A deposit of $10. (ten dollars) will be required for use of plans and specifications, which will be returned upon letting of contracts.

GEO. W. ROBINSON.

Reinforced Concrete Culverts.

The flimsy character of many public highway bridges and culverts constructed is a matter which is engaging the attention of not a few of the Canadian highway engineers. They are practically unanimous in their condemnation of the short-sighted policy of building bridges of low initial cost but highly expensive to maintain and urge the use of concrete wherever lasting and sightly improvements are desired. The way the matter is viewed in the United States is shown by the following opinion:

The Highway Engineer of Wisconsin in concluding a discussion of this subject says: "Concrete makes the best and least expensive culvert. Use reinforced concrete for bridges whenever materials are accessible."

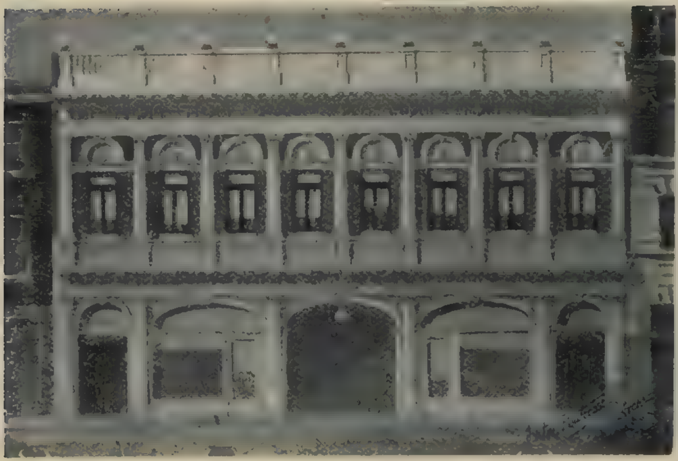
The State Engineer of Illinois, in an annual report, expresses himself as follows: "A structure (of reinforced concrete) when once built is built for all time and it is not a source of constant menace to everyone driving over it for fear of a worn-out plank which may have at last broken through and made a pitfall. Spans of 50 feet and less should be replaced by concrete steel construction, and in many instances in even longer spans reinforced concrete could well be substituted for steel spans and wooden floors."

With these emphatic endorsements many highway experts concur. It would seem the part of wisdom for county officials trusted with the responsibility of selecting a type of bridge to acquiesce in the judgment of trained engineers in a matter of so much public importance.

A Suggestion for Bricklayers.

It is far from our desire to encourage antagonism toward the laboring men, says a United States exchange. On the contrary, we believe that capital and labor should work together. It appears to us, however, that the brickmakers of the country are acting decidedly against their own interests as well as against the interests of the brickmakers and brick contractors, because of their unwillingness to divide the losses in "bad times" with the "other fellows," although they are perfectly willing to take all the profits they can get in "good times" Every job which a brick contractor loses because his bid was too high owing to the excessive cost of brick masonry, means the loss of just so much work for the brick masons. Every new building which is built of other material might have given work to the brick-masons if the cost of their labor was not so high. Bricklayers are among the highest paid workmen in the country. The average wage in cities is 62 cents per hour. The rules of their union are so stiff and adherence to their ill-advised, selfish interests is so great, that their organization tends toward retrogression in brick construction rather than progress. Let them find some way of producing larger results for the money paid to them, or else let them get off their "high horse" and work with the rest of us to promote brick construction.

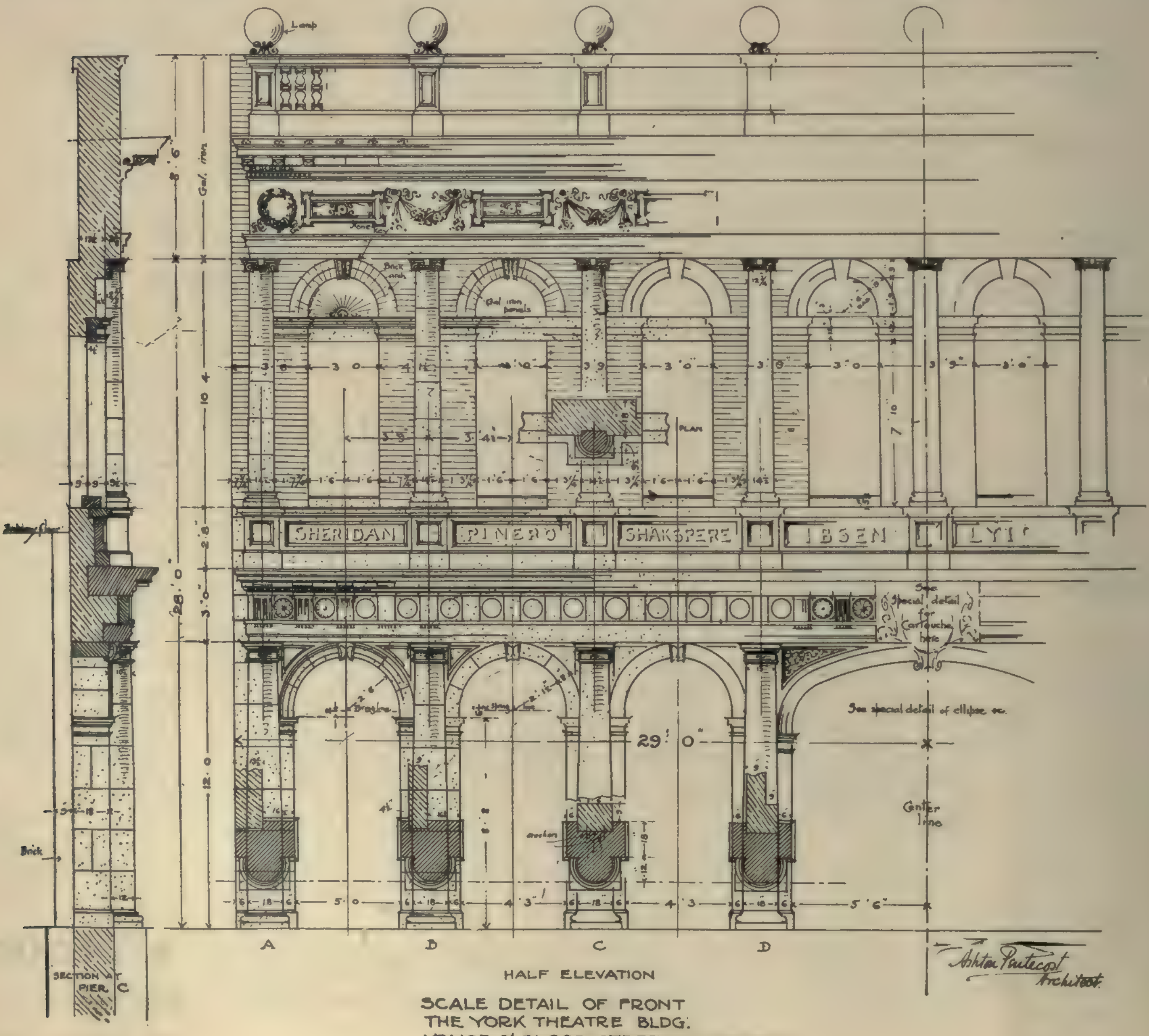
An Up-Town Theatre for Toronto.



The illustrations of the new theatre to be erected near the corner of Yonge and Bloor streets, Toronto, show that the building will be a decided addition to the architecture of that section of the city. It will be constructed of imitation white marble, supplied by the Canadian Art Stone Company. The interior has been designed in a very simple manner. The pilasters carry the trusses and there will be no pillars to obstruct the view. The only ornamentation in the interior will be large ornamental cartouches at the foot of each roof truss. A splendidly designed cartouche will also be placed over the entrance. The architect for the building is Mr. Ashton Pentecost, Traders Bank Building, Toronto.

Concrete roadways and street paving, as well as bridges for municipalities and townships, are now considered to be among the best permanent improvements of the kind that can be constructed. There will be more of this kind of work with each succeeding year. Even the top dressing of country roads with cement grout is something to be considered wherever the best obtainable is required.

Mr. W. A. Evans, of the Evans Company, builders' supplies, Sudbury, Ont., was a welcome visitor at the office of the "Contract Record" last week.



HALF ELEVATION

SCALE DETAIL OF FRONT
THE YORK THEATRE BLDG.
YONGE & BLOOR STREETS, TORONTO.

ESTABLISHED 1886

Contract Record

In which is incorporated

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Bright Outlook For Clay Products.

Despite the general slackening of trade in the line of clay products which, until a comparatively recent date, had been steadily going from bad to worse for nearly a couple of years, the manufacturers who assembled in goodly numbers at Brantford last week found little cause for dissatisfaction in their present lot and discovered several justifiable reasons for the greatest optimism in the future. Some concerns claim to have experienced practically no falling off in trade, but these are exceptions which were provided for by a special dispensation of Providence. However, the bright outlook which was obtained at the Telephone City was as refreshing to many as the camel's drink after a long succession of weary days in the desert. It was generally conceded that the plentiful supply of money, the big building season anticipated, the many great projects throughout the country and the general soundness of trade conditions ensured success for the current year.

There were those present who found more than one note of truth in President McCannell's address, especially in regard to the opportunities for examination and reform which are afforded in slack times. All the defects in the manufacturing departments and offices which must inevitably have insinuated themselves in the busy rush of prosperity of the decade previous to the slump, should have been eradicated by now, so that no time need be lost for the more immediate preparations for doing perhaps a record volume of business in the spring.

The various papers read and the ensuing discussions afforded many useful and practical suggestions. No overestimated value can be placed upon the idea of having the members themselves personally contribute papers and addresses dealing with their experiences and difficulties—and in this perhaps may be found the keynote of the appreciation felt by all members. There was probably nobody present who was unable to learn something at the convention, and if there was, he was altogether out of his element in this sphere. To quote President McCannell, he should have been "in the Better Land."

A strong desire to secure a ceramic school, with the advantages and stimulating influence of a thorough system of technical education, was revealed at the convention, and with so many earnest advocates working for the consummation of this worthy project, success may be regarded as a certainty.

The leavening influence of those who attended the convention will spread throughout the clay workers' business in Canada and continue in force until the next convention at Chatham, when it will probably be repeated on an augmented scale, and so the following year, and the next, until there will come a time when Canadian manufacturers will more nearly have approached the standard of the ideal. Co-operation and good-will such as displayed at Brantford will bring this about. "Unity is Strength."

Ontario Architects' Convention.

The annual convention of the Ontario Association of Architects which was held at Toronto last week proved that this body is one of the most energetic and progressive institutions of its kind in Canada. In the short space of two days it succeeded in carrying out a comprehensive programme which included the display of an excellent exhibit of photographs and drawings of recent work done by members of the association. The programme also included several important discussions upon subjects of much practical interest to architects and the presentation of a number of papers and addresses. The two questions which came in for the greatest amount of discussion were those relating to the education of an architect and the advisibility of obtaining more definite legislation from the Provincial Legislature in regard to the question of restricting the use of the title "architect." Another matter of the greatest importance to all Canadian architects which was warmly discussed was that of the evasion of the duty upon plans and specifications coming into the country from foreign architects.

The two former questions, involving the matter of the education of architects, have been so fully discussed for a number of years past, that it is impossible to bring out new features. One thing, however, was made unusually clear by the discussions, namely, that unless the two opposing groups among the architects of Ontario can agree upon a definite course of action nothing can be hoped for in the way of obtaining further legislation. The Legislature may be anxious and willing to pass a measure which will assist the profession to raise its standard and protect the public against incapable men, but until it can obtain a unanimous opinion from the architects themselves as to the proper course of legislation its hands are firmly tied. If the architects will only agree upon the subject they will be able to get almost anything they ask. The conciliatory manner in which the discussions on this subject were conducted leads to the hope that within the course of a few years at the most a solution of the whole matter may be obtained.

The two opposing groups have come to a conclusion that they must not seek to obtain a measure from the Legislature until they are entirely of one opinion as to what the measure shall be. They have also pretty well come to one opinion against the proposal to ask for the passage of a licensing bill, by which architects would be obliged to obtain a license in order to practice

Convention of Clay Products' Manufacturers

Good Attendance at Brantford—Excellent Prospects Foreshadowed in President's Address.

The seventh annual convention of the Canadian Clay Products Manufacturers, which was held at Brantford, Ont., January 12, 13 and 14, was attended by nearly 100 prominent brick makers, machinery men and others closely identified with the industry, and it was generally conceded that the meeting was an unqualified success. After registration on Tuesday, Jan. 12th, the members were accorded a warm welcome to the city by Mayor Wood and ex-Mayor C. H. Waterous. A discussion upon tile making, led by Mr. Henry Janes, of Delaware, Ont., closed the proceedings for the first day.

Wednesday, Jan. 13th was the busiest day of the session. The morning was devoted to visiting some of Brantford's leading industries. Mr. C. H. Waterous courteously conducted the visitors through the different departments of the Waterous factory and afforded them an opportunity of seeing the leading lines in the actual course of manufacture. Great interest was taken in the large amount of wood pulp machinery. Some of the members admitted that they were ignorant of the extent of the growth of this industry, and the meaning of reforestation was revealed to many when Mr. Waterous stated that one company, alone, operating in Canada required daily the timber from 300 acres in order to fill their needs. That the products of this firm are not restricted to a limited field may be gathered from the fact that some of the machinery now being manufactured is destined for Newfoundland, other products for the Pacific coast, while a recent consignment was for New Zealand. A continuous policy of improvement is advocated by Mr. Waterous, who attributes in no small measure to this idea the success of the past. A tour of inspection was then made of the Allen Red Brick Works, whose output last season was 1,265,000, easily the greatest of any of the local plants, the James Workman White Brickyard, and the Brantford Red Brick Company's yard.

An excellent address was delivered in the afternoon of the second day by the president, Mr. J. S. McCannell, who opined thot valuable lessons might have been who opined that valuable lessons might have been learned by the manufacturers in the recent depression, particularly in regard to business defects that would otherwise have escaped notice. The speaker took an optimistic view of future prospects. He had recently returned from the West, and had both heard and seen something of the wheat crop. After touching upon the benefits to be derived from the convention and making brief allusion to the subject of standardizing the size of brick, Mr. McCannell passed on to a matter which is of the liveliest interest to all connected with the industry—technical education. The speaker referred to the fact that the association had been urging the Government to take active steps in the establishment of a ceramic school and impressed the need of an aggressive policy if success was to be achieved. Mr. McCannell's address is reproduced in full elsewhere in these columns.

Following the presidential address came perhaps the star feature of the convention, an address by Professor A. V. Bleininger on the preparation of clays. Mr. Bleininger recently became associated with the U. S. Geological Survey Laboratory at Pittsburg, Pa., where he is chemist in charge of the ceramic department. During his connection with the University of Illinois and the Illinois Clay Manufacturers' Association, Mr. Bleininger has done some excellent work and by his clear and facile solutions of clay-working difficulties has gained an enviable reputation. Particular interest was taken in Mr. Bleininger owing to the excellence of the papers presented at former conventions by Prof. Orton and W. D. Richardson, both of Columbus, Ohio. Mr. Bleininger's treatise, as well as other papers read at the convention, will be published in a later issue.

An interesting discussion followed an address upon "How to get Rid of Limestone Scum form Brick," given by Mr. John B. Millar, of the Don Valley Pressed Brick Works, Toronto. Mr. Bleininger acted as arbitrator in the debate. A general discussion then ensued relative to the necessity of having a standard size of brick. There was a fairly wide divergence in the sizes quoted by the various manufacturers. The trend of opinion favored a brick 8¼x4x2¼. It was generally conceded that, apart from the neater appearance of a smaller brick, the larger sizes did not pay the manufacturers for the extra bulk. It was finally decided that the executive committee should report at the next annual meeting upon the general feeling of manufacturers and contractors throughout the country. The members of the association seemed to recognize the need of a standard-sized brick, but displayed some caution in giving their opinions, owing, probably, to the expense that would be entailed by any change they might have to make. One prominent maker estimated the cost of changing his dies at $5,000.

Henry Janes, Delaware, Ont., New President of the Association.

The Banquet.

The banquet, which was held in the Belmont Hotel, on Wednesday evening was a most enjoyable function. According to the programme of the convention the list of speakers at the banquet was to be a good one, and in this respect the members were not disappointed. Mr. W. M. Cockshutt, ex-M.P., the first speaker, made some enthusiastic remarks about the greatness of the Dominion and of the important part that will be played in the development thereof by the clay-working industry. Mr. W. S. Brewster, M.P.P., expressed the desire of the Legislature to co-operate with the manufacturers to the fullest extent possible for the attainment of their ends. Mr. R. J. McCormick, M.P.P., Warwick, Ont., gave a brief outline of the early history of the clay-working industry and its development.

One of the most energetic supporters of the convention and one who has exercised great influence in the efforts that are being made to establish a ceramic school is Mr. S. J. Fox, M.P.P., Lindsay, Ont. With such capable members in Parliament as Messrs. Fox, Russell and McCormick the clay workers may well regard their projects with optimism. Mr. Fox's remarks in connection with the growing importance of the industry and his bright views in connection with the manufacturers' ideals were received with the greatest enthusiasm.

Responding to the toast of the "City of Brantford," Mayor Wood expressed the appreciation of the citizens in being honored by the convention. This appreciation, said the mayor, was from the manufacturers' standpoint, for the products of the Telephone City were known all over the world. Mr. Wood stated that there were five thousand mechanics in Brantford, and also added that they could boast of practically a brick city. The speaker incidentally alluded to the project for the erection of a new city hall and hoped that this would be fulfilled by the time the convention next met in Brantford.

James Cornhill, Chatham, Ont., First Vice-President

A tribute to the value of technical education was paid by ex-Mayor C. H. Waterous, who referred to his travels in Germany, and stated that his observations in that country had brought him out as a strong supporter of such a campaign as that now being carried on by the manufacturers of clay products. Mr. Waterous referred to the importance of Brantford as a manufacturing centre and held that the fact that every factory in the city was built of brick was an evidence of the high opinion of the product held by the citizens.

Prof. A. V. Bleininger cited the great advances that had been made in the United States which could be traced to technical education and referred to the new department for ceramic investigation at Pittsburg which was a direct result of the movement. Remarks of a similar nature were made by Mr. W. D. Richardson, of the Richardson-Lovejoy Engineering Company, Columbus, O Mr. Richardson is one of the most prominent clay-working engineers in the United States.

Mr. John B. Millar, of the Don Valley Brick Works, Toronto, responded to the toast of "The Clay Products Manufacturers," and spoke of the association's wide influence for better conditions in the industry. Other speakers were W. H. Freeborn, who represented the local brick interests; J. W. Ball, superintendent of the Toronto Fire Brick Company, Mimico, Ont.; W. McCredie, Lyons, Ont.; W. A. Evans, Sudbury, Ont.; Geo. Crain, Beamsville, Ont.; Wm. Chultz, Brantford, Ont.; D. O. McKinnon, Toronto, and S. de Joannis, of Waterloo, Ont. The subject of Mr. Joannis' remarks was the need of philosophy in the brick business. An idea of the speaker's remarkable versatility is afforded by the following extempore poem:

THE RULES OF PHILOSOPHY.

There's no great ambition in me
To discover a rare fossil;
A philosopher I would be,
Of clay a good apostle.

With problems of ceramics,
I e'er delight to grapple,
And count a hard burnt brick
Worth more than a seedless apple.

Philosophy I bear to you
Quite clear, without deception;
The rules are few, I'm sure that you
To them can't take exception.

Rule I., "Boost!"
Quit all senseless knocking.
The time men waste in roasting men
Is certainly quite shocking.

Rule 2, "Smile!" Your heart won't break,
While you've got strength for friendly shake,
And wear the smile in latest style
For those who make a brick or tile.

"Take your medicine," is Rule 8.
'Tis the hardest in philosophy;
But tho', p'raps, it may seem the worst
It's the key to the second and the first.

There's not an ill you bear to-day
But works out right in some one way;
You're either getting what you ought
Or it's price for future wisdom bought.

The checking brick that make you swear
Were heralds of manufacturing care.
McCredie's limestone pebbles all
Will disappear by this next fall.

We'll fix the brick of standard size
To match with every fellow's dies;
And as for grades, we'll have but one;
We'll charge face price for all kiln run.

Take your medicine! Boost and smile!
You'll find these rules well worth your while.
Excuse these lines—they're made with pain,
But take your medicine—that rule's plain.

*

The banquet came to a close at midnight with the singing of the National Anthem.

Election of Officers.

At the morning session on Thursday, January 14th, the election of officers took place, resulting as follows: President, H. Janes, Delaware, Ont.; 1st vice-president, James Cornhill, Chatham, Ont.; 2nd vice-president, S. M. Mulligan, Ottawa, Ont.; 3rd vice-president, W. H. Freeborn, Brantford, Ont.; secretary-treasurer, D. O. McKinnon, Toronto.

In the afternoon an interesting address was given by Mr. J. W. Ball, of the Toronto Fire Brick Company, Mimico, Ont., upon "Suitable Kilns for the Manufacture of High Grade Brick." Mr. Ball gave an excellent description of the various kilns that he has used in his wide experience in the old country and in Canada and the practical nature of his remarks appealed to all. The value of a cost system was afterwards the subject of a short talk by Mr. W. E. Trout, who emphasized the value of a system that will show the daily cost of production. He stated that American firms spent thousands annually in devising improvements to their cost systems. Mr. Trout said that the most practical way of keeping track of men was by the card system.

S. M. Mulligan, Second Vice-President.

The closing paper of the convention was one upon the "Cost of Manufacturing Operations," which was read by Mr. W. D. Richardson, of the Richardson-Lovejoy Engineering Company, Columbus, O., who defined a cost system as a tool for cutting down cost. Any ideas of extra expense were dispelled when Mr. Richardson stated that no extra labor was entailed in any firm where a bookkeeper was kept. The value of a ready means of comparison and calculation was made apparent to those present by the exhibition of specimen cards, specially enlarged for the occasion. "Maximum production," said Mr. Richardson, "means minimum cost." The expense per thousand decreased in proportion as the output increased. The speaker concluded by likening a manufacturer doing business without an accurate cost system to a captain navigating a vessel along a difficult channel without a pilot.

Several cities were suggested for the next convention, including Chatham, Toronto, London (the birthplace of the association), Stratford and Hamilton. It was finally decided to hold the meeting in Chatham next January.

President's Address.

President J. S. McCannell in his address said:

Another year has come and gone since the convention last met, a year marked by unusual stringency in the money markets of this country. The result of this stringency has been a marked falling off in the building trade and a consequent decrease in the profits of the brick manufacturer. While no one is anxious to see trade slacken up and profits diminish, yet there are lessons to us all, and not only to the clay workers but to manufacturers of all lines of goods. We may find that we have become extravagant in the matter of cost of production, that leaks have occurred which have only come to our notice when we have had more time to look into the matter of cost. During a slack period a manufacturer has an opportunity—in fact is compelled—to see where he can lessen the cost of production. He may find that he has not the most modern machinery and that he is losing money in that direction. His kilns may be out of repair, in fact, they may have become out of date altogether and it may be necessary to tear them down and rebuild them, if he is to keep pace with his competitors. A great many other leaks may be discovered and avoided by having a first-class cost system. It is easy for a brick maker to jump at his cost price, add the wages and full bill together and figure that as his cost price. On such a basis it is only a question of time when the bailiff will take all that he has left—which will not amount to a great deal.

At no time can one afford to do without labor-saving devices, and much less during a period of depression. The machinery man, who is, no doubt, here in large numbers —and who is not an unmixed evil at a convention—will no doubt be able to convince you as to why you should have his machine in preference to that of his competitor. Be that as it may, we have to thank the machinery man with his up-to-date equipment that we are not making bricks by the old horse process and that to-day clay products rank on a par with iron, steel or silver productions. If we have learned our lesson we will go ahead this coming season and make cheaper and better products than we have ever done before.

To my mind the prospects for the coming season are much brighter than they have been for some time. The money market is getting normal. The vast wheat crop of the West, some $30,000,000 dollars ahead of the previous year, will soon spread money through the various channels and the manufacturers will again get busy helping to supply this great West, an idea of whose greatness can only be obtained by travelling over its immense area and seeing for oneself.

A word about the objects of our association. Can any clay worker afford not to be a member? The question will probably be answered in the negative by all present We gather here and exchange ideas, and, if we do nothing else, we go home to our work with fresh inspirations and resolutions which will take active shape during the coming season. To anyone attending the convention is given an opportunity to present any difficulties he may have in his work, and there is no doubt that we may all be benefitted by hearing difficulties discussed intelligently. A solution will generally be found and afforded to anybody who will get up and state his case. Another great source of profit will be found in the quiet talks in the corridors between sessions. There is probably not a member present who will not sit down and discuss his little difficulties with a fellow-member, and both will receive benefit from the discussion. While this association does not deal with the price of brick, an opportunity is presented by the friendly meeting at the convention of rival brick makers from the same town to discuss together the price of brick. We see in a great many cases two firms working in the same town each trying to cut the other's throat. A friendly understanding would make all the difference between profit and loss at the end of the season.

A word regarding the size of brick may not be out of place. We find sometimes where bricks are put on a job from two different firms that the sizes are not nearly the same. Why should not this convention approve of a standard size for brick for Canada and let each maker try to keep his moulds so that all may make bricks of a uniform size?

It is pleasing to note that a greater interest is being taken in regard to technical education in Canada. This branch of study which has long been neglected in our country has failed to receive the attention to which it is entitled. Thoughtful men who are at the head of educational affairs are advocating more and more the technical training of our young men in schools of all grades. It is only a short time ago since a new technical school was opened in Montreal by His Excellency the Governor-General, who spoke in no uncertain terms of the benefits of technical education. One has only to look at the immense strides taken in other countries, such as Germany, to realize that we must give more attention along this line if we are to keep pace with the growth and development which is bound to come to our country in the next few years. It is in this direction that the association has been urging the Government to take active steps towards establishing a branch in connection with the School of Science where clay workers may receive a training similar to that given to students in metallic products.

The Government recently sent a deputation to Columbus, Ohio, where a school is in operation in connection with the State university. Those of us who have had the pleasure of visiting this school cannot fail to agree with the deputation that the benefits to be derived in our country from this class of school are very great. The Government realizes all this and it is up to us as clay workers to pursue an aggressive policy if we are to attain our desired object.

Stucco Ornamentation of Ceilings.

Until very recently it was the prevailing fashion in all houses of any pretension to elegance of interior finish, to introduce more or less elaborate ornamentation of the ceiling, with the aid of stucco, which was finished in colors, giving a somewhat florid, but, for apartments of good size, an attractive appearance, says "Shoppell's Magazine." This fashion still retains much of its popularity, but the taste for decoration is so strongly on the increase that, to satisfy it, a number of new and appropriate methods of treating the ceiling have been devised.

For good artistic and sanitary reasons, painted walls and ceilings are preferable to those covered with paper, and the stencil plan of finishing the ceiling is based upon this admitted principle. The stencil may be made plain or elaborate, to suit the individual taste. They are cut in paper and in cloth-faced paper, and the painter or decorator may select from a great variety of designs in the specimen book of the manufacturer a sufficient variety to suit every taste. The use of these stencils requires no special skill, and any painter of ordinary intelligence will be able to reproduce the design with comparative ease.

A pleasing effect will be produced by tinting the whole ceiling in cream color, while the frieze, garlands, pearls, etc., of the stencil design would be stencilled with bronze or bronze color, the ribbons and streamers in delicate pink, which may be shaded with carmine, and the cornice in different shades of cream. In small rooms it is advisable to leave off the frieze and use it as a wall frieze.

All the stencils necessary to produce a decorated ceiling may be had from any dealer in stencils, in attractive designs.

Heating and Ventilation of Schools.

Rapid progress has been made during the past decade in the heating and ventilation of school buildings, says Louis S. Stone in the course of an interesting article upon "Modern School Architecture." Years ago, stoves which roasted the near pupils and let those on the outer edge suffer with cold were the rule. Then cheap pot furnaces that burned the air to such an extent that it was not fit to breathe, were put in school buildings. Now no intelligent school board thinks its new school building complete and up-to-date, without a plenum system of heating and ventilating, insuring a continuel supply of moderately heated fresh air evenly distributed throughout the room, being completely replenished about exery six minutes. The temperature of the air in this kind of a system should be automatically controlled, making it unnecessary for the teacher to give any of her time or thought to keeping the room at a certain temperature.

A modern system of heating and ventilating means that the architect must be familiar with the requirements of the same, and plan the proper spaces for fresh air and vent ducts and the proper inlet of the fresh air supply to the fresh air room. Good results cannot be attained by crowding a plenum system into small, inadequate spaces. It is better to have a large inlet for the fresh air propelled by means of a mechanical blower at a low speed, than small flues admitting the air at high speed, for the reason that it is more economical to operate at the low speed and prevents any tendency to draughts. The system also will last longer.

The modern system of heating and ventilating also permits of lower ceilings than formerly, and is economical in the use of time on the part of the janitor, as the whole heating and ventilating apparatus is at one central point instead of being scattered all over the building.

These matters have a direct bearing on the health and minds of the school children, so that in correcting the effects of bad lighting and poor heating and ventilating, not only the health, but the work of the child is improved.

Mr. Duncan Sinclair, B.A.Sc., Ass. Mem. Can. Soc. C.E., died at his home, Cheltenham, Ont., recently. Mr. Sinclair was of Scotch parentage and a native of Peel County. He was educated at the Cheltenham public school and Georgetown high school, and entered the Faculty of Applied Science of Toronto University in the fall of 1899. He received his degree of B.A.Sc. in 1903. While at college he was elected president of the Engineering Society of the School of Practical Science. After graduation Mr. Sinclair spent some time with the Hamilton Bridge Works, Hamilton, the Canada Foundry, Toronto, and the G.T.R. Company, Stratford. In April, 1905, he went to New Liskeard, Ont., and entered into partnership with William Blair, B.A.Sc., under the firm name of Blair & Sinclair. Later the firm name was changed to Sinclair & Smith, and more recently to Sinclair, Sutcliffe & Neelands.

Reinforced Concrete for Architectural Construction

A Discussion of Its History and Principles by Walter J. Francis, C.E., before the Ontario Association of Architects.

The marvelous developments of the past forty years in all branches of art and science have been the subject of numberless volumes, and the nineteenth century in its last quarter will in this respect be without a parallel in the pages of history. It is possible that in discussing these developments one might first think of the advance in the field of electricity, effecting as it does so many of the larger of the world's affairs to-day, or of the advances in surgery, but of equal importance to mankind are the applications of those new methods of permanent and fireproof construction which are perhaps the most noted advance that the ancient and noble art of architecture has made since the days of ancient Greece and Rome.

To the introduction of calculus, mathematics and applied science owe their most important advancement. The germ theory gave to medicine its greatest impetus and is responsible for the new system of preventive medicine. In the same manner a new and important system of architectural construction was evolved and the construction of permanent and fireproof buildings advanced with great rapidity, when in place of the comparatively large pieces of wood, brick and stone, the builders employed the atoms of cement combined with the particles of sand, the crushed stone and the small sections of steel.

The invention of steel, the earliest practical application of which to engineering and architectural construction is still fresh in the memory of many of the profession, rendered possible the erection of the modern tall buildings. Without steel the present-day reinforced concrete systems would be impracticable.

Reinforced concrete as a general builder's term, refers to a Portland cement concrete combined with steel rods. Usually the steel is so disposed in the compound mass that it will care for tensile and shearing stresses that may be set up from any cause, the concrete itself furnishing the compressive strength. To this general rule there is an exception, however, inasmuch as in some types of columns the steel is introduced solely for compression purposes.

The combination of these two construction materials —concrete and steel—which formerly had been and are still being extensively used separately as simple materials for well-defined purposes, is from both theoretical and practical considerations a very desirable one. The coefficient of expansion by heat is almost identical for the two materials, so that variations of temperature will have no effect on the composite structure. Probably the most important feature, however, in this connection is that while the concrete is comparatively low in tensile strength its durability and permanency are of the highest order. Steel, on the other hand, although possessing the highest tensile strength of all the common construction materials, is one of the least enduring. A bright steel surface is visibly affected by ordinary atmospheric conditions in ten minutes, and unless protected its life is very short. The most efficient and practical protection yet known for steel is Portland cement. Our present knowledge of the subject leads to the conclusion that steel properly embedded in Portland cement concrete is absolutely protected for all time irrespective of moisture conditions. Further, the adhesion of cement to steel is very considerable and has been carefully studied and measured.

Tests have shewn that the composite body is perfectly elastic within working limits. While it cannot be claimed that present knowledge of reinforced concrete is anything like complete and all the best formulæ have been deduced for the design of reinforced concrete, still the assumptions are safe on which the approved formulæ are based. In the case of the older materials the formulæ accepted do not apply beyond the elastic limit.

When the architects erected the Pantheon at Rome shortly before the Christian era they knew how to use hydraulic cement so well that the 142-foot concrete dome of that interesting structure has withstood the elements through nearly two thousand years and it is in perfect condition to-day. Time will not permit of more than a passing reference to the fact that the art of making hydraulic cements appears to have been lost until Smeaton built the Eddystone lighthouse in 1756. Portland cement was first produced in 1824 and for 25 years England led in its manufacture. Germany then gained supremacy in cement making until a few years ago, when the United States surpassed all other countries as a maker of Portland cement.

The First Use of Reinforced Concrete.

The first recorded instance of the use of reinforced concrete was in 1855, when M. Lambot, of Paris, exhibited a small row boat made of wire netting and cement mortar, 1½ inches thick, which is said to be still in use. In 1866 M. Monier was granted patents on reinforced concrete, but he confined it to the construction of troughs, waterpipes, tubs and reservoirs. The Germans, however, are largely responsible for the successful development of the system of reinforced concrete, which they really began about 1880. In France M. Hennebique was the first engineer to design floor beams and slabs and to develop formulæ for proportioning them The study by American engineers appears to be contemporary with that of the Germans and in 1775 W. E. Ward erected a complete building at Port Chester, N.Y. He built rods into the lower sides of his beams and joists much as they are built to-day, relying on his judgment, in the absence of formulæ, to guide him in proportions. The need of fireproof floor construction is in a measure responsible for the development of the system which was also studied carefully for use in culverts and short-span bridges. After the successful completion of the first examples the progress, although gradual, was uninterrupted. To-day we see this system responsible for the investment of millions of dollars. In the last few years buildings have been erected for every kind of duty throughout the world. Its use is not confined to the construction of the least pretentious, architecturally, of all buildings—the factory. Many elaborate hotels have been erected of reinforced concrete, to say nothing of countless warehouses and office buildings. Even the field of the skyscraper, so long closed to all but structual steel, has been invaded, and we find a 16-storey office building in Cincinnati that has a skeleton of reinforced concrete from basement to roof.

The applications of the system are very wide. The engineer to-day is using reinforced concrete successfully for purposes not dreamed of ten years ago. Incidentally he is learning what it is not adapted to—knowledge of great value and inseparable from the development of every important system. One writer on the subject says something like this: "Formerly concrete was good for nothing. Then it was applied to everything. Now we are learning." The system is here to take its place amongst the highest types of construction. Its application to architectural requirements will now be discussed, dwelling more particularly on those features which are not particularly referred to in the standard authors and which concern the architect in his relations to the owner and to the contractors. Time will not permit of a discussion of detail design and calculation which is fully taken up in the standard works of reference.

The Lyman Building, Montreal.

Types of Reinforced Concrete Buildings.

Reinforced concrete buildings may be divided generally into two classes—entirely of reinforced concrete, and reinforced concrete interior only. Of the latter class there are divisions, since we may have an entirely self-supporting skeleton or one in which the exterior walls sustain a proportion of the floor systems. Of the first general type we may take as an interesting example the American Tobacco buildings of Montreal. For the second type with self-sustaining skeletons the Chateau Frontenac at Quebec, and the Lyman and the Southam building in Montreal may be used as good examples. As an instance of floor sustaining exterior walls the Ames-Holden building in Montreal may be taken. These are all Canadian buildings of the highest type for their respective uses, representing heavy manufacturing and warehousing purposes, office use, hotel use, and light manufacturing. Very large buildings, such as may be found in all the large cities of Europe and the United States, are not yet numerous in Canada. This is not the result of climatic conditions but rather the age and wealth of the other countries.

Design of Reinforced Concrete Buildings.

As in every other branch of heavy buildings, the design of the constructional part of reinforced concrete structures is best carried out by specialists who are, ordinarily, trained architects or engineers who have had actual experience with field construction and who can appreciate fully not only the possibilities but the limitations of the material. That a good mathematical knowledge and considerable constructive ability is necessary need not be emphasized. Reinforced concrete, like many other new systems of construction, has suffered in the past from over-zealousness on the part of its friends. Its design should never be attempted by rule of thumb methods.

It frequently happens that a building has been laid out for some other type of construction and at a later date becomes merely a translation by having reinforced concrete substituted for the material originally intended. Such methods cannot, of course, produce the best or even passably satisfactory results. For the proper and economical use of reinforced concrete the layout must be studied from that point of view.

The writer does not for a moment think that reinforced concrete should be used throughout every part of a building. Other things being equal, there are many instances of the material having been adopted where some other material would have been much better. Within reasonable limits the material best suited for the purpose should be used. For example, because reinforced concrete has been decided on for an interior, that is no reason why structural steel should not be employed for roof trusses for certain designs, or that terra cotta should not be used for ordinary partitions. Stairways, balustrades and similar details are usually much cheaper and quite as satisfactory in metal.

The selection of the form of reinforcing steel in the present state of the art will depend to some extent on the individual taste of the designer. Some pin their faith to plain bars, many want them twisted, while others rely entirely in their designs on deformed bars of various shapes and types. Good work has been and is being done by all. The writer uses, ordinarily, plain round rods and sees no reason to indulge in anything more expensive. They can be procured practically anywhere in the open market and can be fabricated and put in place for from $37.50 to $47.50 per ton. His next choice is twisted squares, not so much on account of the possible mechanical bond given by the spiral as the fact that the elastic limit of the steel is raised in the twisting and none but high quality will stand the process. Speaking broadly, we then come to the "deformed" bars of which there are numerous varieties. The general idea sought by their advocates is to obtain a "mechanical bond" to help out the adhesion between the cement and the plain steel. Many of the best authorities and those who have been instrumental in bringing reinforced concrete to its present state of perfection, hold to the opinion that mechanical bond should be adopted in all cases. With this view the writer does not agree. The simple adhesion is sufficient to develop the strength of the steel. If the adhesion does not exist then the mechanical bond will not save the structure. To make satisfactory work the concrete must be made properly wet, in which case it will adhere to the steel. Anything that prevents proper

Lyman Building, Montreal, During Construction.

adherence is detrimental and cannot be counteracted by any amount of mechanical bond.

In detail too much stress cannot be laid on the importance of liberal fillets where abrupt changes of shape occur, as they obviate shrinkage cracks in the setting just as they do in cast iron and steel in cooling. Corbels should be introduced where the main beams join columns to add to the general rigidity of the building. In steel skeletons this duty is performed by knee braces and wind bracing.

Addition to the Chateau Frontenac at Quebec.

Those who have followed the subject closely will have observed the immense amount of discussion that has taken place during the past few years on the general design of column reinforcing. The column has received a great deal of attention through jealousy of the floor space it occupies. The writer will admit that New York and London rentals will demand the maximum available floor space, but he believes that in a general way the space occupied by columns is really not so important as many owners imagine. In any event, the desire to dedecrease column dimensions appeared serious and important, so it was given special attention. The earliest columns had vertical reinforcement. At a later date M. Considere, of France, and Mr. Jameson, of Montreal, during the same time and unknown to each other, developed the hooped column, the idea being that the concrete if restrained from side flow would stand a very much greater pressure than otherwise, which proved to be true. As an exaggerated example of this action—if loose sand be put into a tube and not permitted to escape, the amount of load it will sustain will depend entirely on the bursting strength of the tube. The "hooped" or "spirally reinforced' column has proven very satisfactory in large tests. Other designers pin their faith to vertical rods placed near the circumference of the column with hoops about the verticals spaced at least as close together as the distance apart of the outer rods. Still other designers would make practically a structural steel column, the concrete encasing it being really for fireproofing only. In the writer's judgment many of the building codes require too low a unit stress, many of the owners have an undue prejudice against putting an extra inch or so on the dimensions of columns, and there has possibly not been sufficient consideration given to the fact that cement itself is one of the strongest, cheapest and best reinforcements. This phase of the subject will be dealt with at length under the head of by-laws and specifications.

In locating the steel members great care should be exercised to obtain at least 2 inches of concrete outside of all metal in order to protect the steel from the action of fire. A further precaution is necessary to see that the steel members do not come too close together, for two reasons, first, in order to provide a sufficient body of concrete to transmit the stresses in the composite mass properly, and, secondly, to prevent the reinforcing members from acting as a screen to separate the component parts of the concrete in the pouring and thus form voids. Generally speaking there should be at least two inches between rods.

The subject of the proper proportions of cement, sand and stone is one worthy of the most careful consideration. On general principles it is well not to have too many formulæ on any one job, because it is confusing to the workman and apt to lead to serious errors, and, again, the different mixes are very likely to cause shrinkage cracks at the junction of the two. In a general way 1:1½:4 or 1:2:4 makes a very good mix for columns and 1:2½:5 for beams and slabs.

Concerning the advantage of rich mixtures, Prof. Talbot in one of his most recent pamphlets says, "The effect of the amount of cement used in the concrete is very marked and cement is shown to be an economical reinforcing material for compression members. A 1:1½:3 concrete at 60 days gives an average ultimate strength of 2,300 pounds per square inch, while a 1:2:4 gave 1,740: 1:3:6, 1,030, and 1:4:8, 575, under the same conditions."

If rich mixes are decided upon they should be used with regard to uniformity not jumping from say a 1:1:2 for columns to 1:2½:5 for beams.

For dwellings cinder concrete is amply strong enough for floors and is much lighter than that made with sand and stone. The best authorities appear to agree that no detrimental effect is to be feared by the possible presence of sulphur in the cinders acting on the steel.

For floor work all of the standard floor reinforcements are good, and in the writer's judgment this point resolves itself into one of price. In heavy floors ⅝-inch or ½-inch rounds are very satisfactory. The wire reinforcements are also good, the wire being of high tensile strength and convenient to handle.

Interior of General Electric Building, Peterborough, Ont.

Regarding rust on the steel, the best authorities agree that a slight amount of rust is not harmful and, indeed, some consider it beneficial. The writer in his practice prefers the steel to be practically free from rust.

A most important feature of the design is the accuracy of the plans. It must be remembered that the reinforced concrete type of building is unique, inasmuch as every element of the structure goes on the ground in its raw state, bearing absolutely no resemblance to its finished form. The superintendent and inspector must be supplied with absolutely correct information or later on the wail will be heard that it is very difficult to make alterations in reinforced concrete.

Construction of Reinforced Concrete.

The correct plans can only be executed by a competent and skilful superintendent co-operating with a qualified building inspector (Kindly note the word co-operation.) The claim so commonly heard by the advocates and friends of reinforced concrete that it is cheap because unskilled labor can be employed, must be properly interpreted. Unskilled labor may be used and should be used in the proper place, but that place is not the position of responsibility in reinforced concrete structures. The superintendent and the inspector must be able men and the chief foremen engaged in the word should be first-class men or unnecessary cost will be the result.

The particular duties of the inspector are to see that the plans are faithfully adhered to and that the materials are properly received and stored. The cement, sand and stone require special attention. The alignment and cleanness of the formwork and the accurate fabrication and placing of the steel, he should check up while there is yet time to rectify any errors.

The testing and care of the cement is of great importance. Only well-known standard brands of cement should be used. The storehouse must be perfectly dry in every particular, and the cement must be so piled that no error may result through the use of untested cement. Tension briquettes should be made on all cements, their chief use being the gain in strength through time. On most buildings this, of course, is quite useless since ordinary requirements demand the use of the cement before the tests are complete. Consequently all but the short period tests are practically eliminated. The "boiling" or "constancy of volume" test is, in the opinion of the writer, of the greatest importance to detect the presence of free lime. It must be made every time. All the standard brands will always pass the tensile and fineness tests, but the writer has known many of them to fail at times in the boiling test. Failure to pass the boiling test may mean that it is only necessary, if nothing better can be done, to pile the cement with plenty of air space so that the lime may have an opportunity to air slake. This may take six weeks, but even at that it may be the only remedy. The writer has been forced at times to deal with thousands of barrels of cement in this way—cement which had passed all the other tests quite satisfactorily. Where possible such cement should be removed and replaced by satisfactory material. The writer does not for a moment wish to belittle the standard tests; he only wishes to point out the advantage of one of the speediest and easiest of the tests on cement, and at the same time for construction purposes one of the most important.

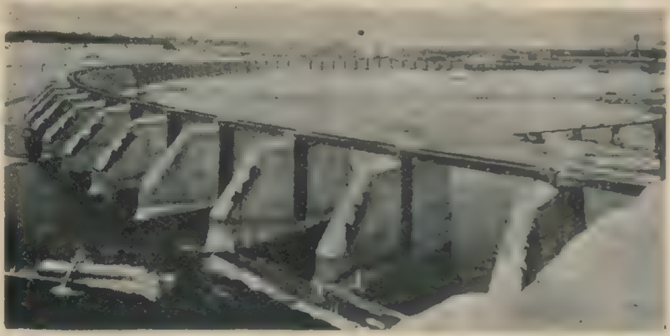
The boiling test as described in the latest Government specification is as follows: To test the soundness of the cement, at least two pats of neat cement mixed for five minutes with 20 per cent. of water by weight shall be made on glass, each pat about three inches in diameter and one-half inch thick at the centre, tapering thence to a thin edge. To be well trowelled to work out air bubbles and surplus moisture. The pats are to be kept under a wet cloth until finally set, when one is to be placed in fresh water for 28 days. The second pat will be placed on the rack in "Faya hot bath tank," over the vapor of water heated to 170 degrees Fahr. and allowed to remain there from three to four hours, after which it will be placed in the hot water, temperature 170 degrees Fahr., where it will remain for the balance of the 24 hours, and then be allowed to cool. In some cases it will be found desirable to raise the temperature of the water to the boiling point, 212 degrees Fahr. Neither sample should show distortion or cracks. If possible all the standard tests should be systematically conducted on important jobs.

(Continued in next issue.)

Rapid Construction of Ottawa Dam.

The reinforced concrete dam over the Ottawa River at the Chaudiere Falls, between Ottawa, Ont., and Hull, Que., of which an illustration is published herewith, is one of the most interesting works of its nature which have yet been constructed in Canada. The first concrete was laid on Sept. 26, 1908, and the last concrete for 1908, was placed on Dec. 19th. During this time 8,925 cubic yards were put in place to form the foundations and piers. There are 49 piers and two abutments. It will be seen from the illustration that the dam is of the stop-log type. The openings are 22 feet wide and 22 feet high. It is proposed to raise the water 15 feet above the stop-log sills. The stop-logs are of Douglas fir, 23 feet 10 inches long and 16 x 16 inches, 16 x 18 inches, and 14 x 16 inches in their other dimensions.

In the summer of 1909 the bridge will be constructed, which will be a slab of reinforced concrete 16 inches thick. This bridge will support the rails for a travelling electric winch, which will be used for handling stop-logs. The steel used in the work which has been done up to date, amounts to over 700 tons, and the work of excavacion performed amounts to 7,400 cubic yards. The contractors for the work are Messrs. Quinlan & Robertson, Montreal.



Reinforced Concrete Dam Over Chaudiere Falls, Ottawa.

The design for the dam is a collaboration of designs and ideas worked out by a commission of four, consisting of Mr. William Kennedy, Jr., of Montreal, who is the engineer for the north side power owners; Mr. Geo. Milne, representative of the north side power owners; Mr. Wm. Baldwin, representative of the south side power owners and lessees, and Mr. J. B. McRae, as their engineer.

The plaster contractors of the larger American cities are forming a national association to promote a greater plaster business which is suggested by the new materials that are coming on the market, and new methods and systems for the decorative treatment for both interior and exterior work. They realize that great progress in their trade can be promptly accomplished by co-operation and intelligent exchange of ideas and experience. They realize also that to keep abreast of the progress of the times they must get together and work together as plaster specialists.

Jan 20, 1909

Ontario Association of Architects' Convention

Successful Annual Meeting at Toronto—No New Legislation to be Sought This Year.

The annual convention of the Ontario Association of Architects was held on Tuesday and Wednesday of last week in Toronto. There was quite a good attendance, and a great amount of enthusiasm among the members. Following is a list of those who signed the convention roll-book:

A. E. Watson, Toronto; J. Wilson Gray, Toronto; Wm. F. Sparling, Toronto; Geo. W. Gouinlock, Toronto; J. A. Ewart, Ottawa; J. Francis, Brown, Toronto; J. J. Woolnough, Toronto; E. Menges, Toronto; F. F. Saunders, Toronto; A. Frank Wickson, Toronto; Wm. R. Gregg, Toronto; A. H. Gregg, Toronto; Thomas Kennedy, Barrie; Edmund Burke, Toronto; Ernest R. Rolph, Toronto; John W. H. Watts, Ottawa; C. H. C. Wright, Toronto; F. S. Baker, Toronto; Murray A. White, Toronto; John A. Pearson, Toronto; John E. Belcher, Toronto; E. H. Bishop, Toronto; Andrew Sharp, Toronto; Elmer Russell, Toronto; Grant Helliwell, Toronto; A. E. Nicholson, St. Catharines; R. J. Edwards, Toronto.

The convention was opened on Tuesday at 1 p.m., by an exhibition of photographs of recent work, which was followed at 2 o'clock by the official opening, when the president, Mr. H. B. Gordon, Toronto, delivered an address. President Gordon's address was full of interesting matter and is given more fully in another part of this report. After the minutes of the last meeting had been adopted, the reports of the registrar, Mr. W. R. Gregg, Toronto, and of the treasurer, Mr. A. H. Gregg, Toronto, were read and adopted. Both showed that the association was in a satisfactory condition so far as members and finances were concerned. Other reports were presented by various committees, the report of the Education Committee being presented by Mr. Edmund Burke, Toronto, and that of the Legislation Committee by Mr. Geo. W. Gouinlock, Toronto. The report of the Ottawa chapter was presented by Mr. E. L. Horwood, Ottawa, and that of the Toronto chapter by Mr. W. F. Sparling, Toronto.

A letter was read from the secretary of the Architectural Institute of Canada, stating that it had taken preliminary steps toward a movement for the federation of architectural associations in Canada and asking the Ontario Association to appoint a representative to meet and confer upon the subject with representatives of other similar bodies in Canada. The letter suggested that the committee should meet some time in February or March at Toronto. In connection with the report of the Ottawa chapter an extremely interesting letter was read from its secretary, Mr. F. J. Alexander, relating to the question of the duty upon architects' plans and specifications when imported from foreign countries. This matter has caused a great deal of trouble for architects and the Ottawa chapter have made a number of enquiries into the situation at the Customs Department in Ottawa, the results of which they outlined in their letter. Some discussion took place during the meeting in relation to the question of regulating the use of the word "architect" and of instituting a course of study with a view to obtaining better control of educational matters generally. This was only a preliminary discussion, however, as the subject was to be taken up more fully at the following session. An interesting report was read from Mr. D. B. Dick upon the International Congress of Architects recently held in Vienna. In Mr. Dick's absence, the report was read by Mr. W. L. Symons, Toronto.

An extremely interesting paper upon the subject of reinforced concrete was read by Mr. Walter B. Francis, C.E., of Montreal. Mr. Francis' paper was very lengthy and dealt with the subject from almost every point of view. It was illustrated with a number of lantern views showing typical examples of reinforced concrete construction. An instalment of Mr. Francis' paper is published elsewhere in this issue, and the balance will appear in the following issue.

The Banquet.

In the evening an enjoyable banquet was held at the St. Charles restaurant, at which the president, Mr. H. B. Gordon, presided. Among the guests present were Mr. Wyly Grier, Toronto; Dean Galbraith, S.P.S., Toronto; A. B. Barry, president of the Engineers' Club, Toronto; Jas. Baird, Toronto, representing the legal fraternity, and Walter J. Francis, C.E., Montreal. The toast list was as follows: "The King," proposed by the chairman; "The Profession," proposed by Mr. A. F. Wickson, with reply by Edmund Burke; "Our Guests," proposed by George W. Gouinlock, replied to by Dean Galbraith and W. J. Francis; "Sister Societies," proposed by A. H. Chapman, responded to by Mr. Wyly Grier on behalf of the Ontario Society of Artists, Mr. A. B. Barry, on behalf of the Engineers' Club of Toronto, and Mr. J. W. H. Watts, Ottawa, on behalf of the Architectural

Geo. W. Gouinlock, Toronto, New President of The Ontario Association of Architects.

Institute of Canada; "Legislation," proposed by Mr. A. H. Gregg, replied to by Jas. Baird; "Out-of-Town Members," proposed by Grant Helliwell, Toronto, replied to by E. L. Horwood, Toronto, and A. E. Nicholson, St. Catharines; "The Ladies," proposed by Elmer Russell, Toronto, replied to by Eustace G. Bird, Toronto; "Our President," by Mr. J. W. H. Watts, with reply by President H. B. Gordon. The speeches were all brief and interesting, and there were a number of good songs contributed by Mr. Hartwell DeMille and Mr. E. L. Horwood.

On Wednesday morning a drive around the city was taken, to visit buildings of interest.

At the Wednesday afternoon meeting, majority and minority reports were presented by the committee which had been appointed upon the question of legislation. The majority report recommended that an application should be made to the Legislature for an amendment to the charter of the association, dealing with the matter of architects' education. The minority report was in favor of seeking to obtain the passage of a licensing bill similar to that in force in the State of Illinois. The association accepted the majority report but failed to act upon it, as a motion for its adoption was defeated. The minority report failed even to be received by the association. In connection with the majority report a number of speeches were made and those who favored it were very decided in their advocacy. They sought to have the present law amended so that all persons who had practised for two years before the 1st of May should be allowed to continue to practice without becoming members of the new association, also that any one who had obtained a certificate granted by the Senate of the University or the faculty of applied science should be admitted to the practice of the profession on serving two years as a student. It was also recommended that the words "registered under the Act" be struck out and substituted by the words "a qualified architect who is registered under the Act." By these means it was believed that they would be able to prevent any one from calling himself an architect who was not registered.

Grant Helliwell, Toronto, First Vice-President.

A committee was appointed to consider the advisability of affiliating with the Architectural Institute of Canada.

The following additions to the by-laws were adopted:

"No member of the association shall be either a building contractor or manufacturer of building materials, nor shall he have any pecuniary interest in any contract or work carried on under his superintendence, or in any materials used in the said work.

"No member shall accept direct or indirect compensation for services rendered in the practice of his profession other than the commission received from his client."

An interesting illustrated address was given by Mr. W. A. Langton, Toronto, upon "Style in Architecture." Mr. Langton's remarks were much appreciated and the views which he used for illustrations were greatly enjoyed by all present.

Mr. A. F. Wickson read a paper from Prof. C. Francis Osborne, of the University of Pennsylvania, on "Architectural Education."

Messrs. J. A. Ewart, Ottawa; Grant Helliwell, Toronto, and A. F. Wickson, of Toronto, were elected to the council, which elected the following officers for the present year: President, Geo. W. Gouinlock, Toronto; 1st Vice-president, A. Frank Wickson, Toronto; 2nd Vice-President, J. A. Ewart, Ottawa; Treasurer, Grant Helliwell, Toronto; Registrar, Wm. R. Gregg, Toronto.

The President's Address.

The address of President H. B. Gordon, before the annual convention of the Ontario Association of Architects dealt exhaustively with a number of interesting matters. It was in part as follows:

"This being the twenty-first annual convention, we are reminded that the association is now of age. I hope we feel the full responsibility of manhood and are willing to enter fully into the obligations of our position.

"How much has been accomplished for the profession and for the bettering of architecture in Ontario during that period, and what a large share this association has borne in bringing such things to pass, I need not take time to relate. Those who have been members from its inception and remember the condition of affairs before that time, can fully understand what progress has been made. Then, mutual distrust between the members of the profession, the cutting of fees, the stealing of one another's clients, and the slandering of others' professional reputation. Now, at least some measure of brotherly feeling and of ethical and professional conduct, certainly a higher scale of remuneration, and a position of greater esteem in the eyes of the public. Then no formulated educational standard and few adequately trained men. Now a clearly defined standard for general efficiency and a considerable number of men seeking to attain it. These and a great many other benefits can largely be traced to the work and influence of this association. Even those who are most indifferent to the success of the association or are openly opposed to some of its aspirations, must be glad of the measure of progress that has syncronized with the history of this organization."

Mr. Gordon then dealt with the question of architectural education, stating that everyone admitted that it was for the benefit of the public that all architects should be properly educated. Certainly it would be for the uplifting of the profession. The value of the scientific part of the architectural education appealed to all men. Building operations were becoming more complex and the demand for scientifically trained men was apparent. Each failure of a building that occurred proclaimed loudly this necessity. Architects, however, were bound not only to design buildings that would not fall down, but their buildings should be planned in such a scientific manner that the proper use of each material in its due proportion and correct relation should produce the best permanent result. The architect, moreover, had an even higher duty, viz., to so plan, proportion and decorate his buildings as to make them object lessons that would elevate the taste of the community. The creator of a badly proportioned or vulgarly decorated building committed a crime against society. This led to the vexed question, how should this education be accomplished? Should it be left a purely voluntary matter or be made in some measure compulsory. After dealing with the arguments, pro and con, on the voluntary and compulsory aspect of education, Mr. Gordon took some pains to dispel the mistaken idea that the Ontario Association of Architects wished to lord it over all the members of the profession in the province, and he concluded his reference to this subject by saying:

"What have the public to fear from placing the matters of architectural examination and professional discipline in the hands of such a body as the Ontario Society of Architects? Supposing that the Legislature granted our desired amendments, made all bona fide practicing architects in Ontario members of the association, and imposed reasonable government control over the decisions of this body, what would happen? Builders and others might go on making plans and charging for them. Any amateur might go on drawing plans and charging for them, and any other fool might employ him without let or hindrance. No limitation of freedom wolud be felt in any direction save one, viz., no man might call himself an architect unless he honestly had a right to do so. . . . . After twenty or thirty years' operation of such a law, when those who had come in without examination had retired from practice, anyone employing an architect might be quite sure that the man he employed had an education that might enable him to rightly discharge the responsibilities of his position. Think of the incalculable benefit to the public if all our buildings were designed and carried out under the supervision of competent and trained men."

Mr. Gordon then referred to the recent convention of the Architectural Institute of Canada and bespoke for it the support of all who had the interests of the profession at heart.

Provincial Building Laws Needed.

Continuing, Mr. Gordon said: "Another matter that should receive attention from this association is the desirability of some general building laws covering the whole province. To what extent this is feasible in view of our municipal form of government is yet to be discussed. The necessity for it cannot be doubted by anyone who gives due consideration to the matter. While some of our cities have building laws, more or less complete, the major part of the province is entirely without restrictions, so that each builder is a law unto himself. The safety of the public from insecure construction and unsanitary arrangements demands some broad general laws. The danger to life and the enormous waste of property by fire make such laws imperative. Canadians are among the most extravagant of peoples in the annual offering they make to the fire fiend. We need not wonder at occasional hard times when we allow so many millions annually to go up in smoke. While more stringent regulations are possible and necessary in the large centres of population, there are a great many restrictions that can be wisely imposed upon building operations all over the province. Take, for instance, our schools, where often hundreds of children are together in buildings that are little more than fire traps. The appalling loss of 150 children in the Colinwood school fire on the other side of the line and the somewhat similar catastrophe at Hochelaga call loudly for some amendment to our present happy-go-lucky methods. Some general laws covering requirements as to exits, fire protection, materials and disposition of staircases, etc., are urgently needed. The average school trustee or the average councilman who votes the money for schools has neither the knowledge or discernment to insist upon these necessary requirements in school buildings, and most likely is moved principally by the matter of cost. The average man who designs or constructs schools throughout the province, even if he understands the need of protection against fire and panic, may yet lack the force of character necessary to impress his views upon a penurious school board or council.

Some of the town halls and many of the places of popular amusement throughout the province, where large crowds assemble, seem specially constructed to invite a catastrophe. Inadequate exits, flimsy wood construction and dangerous methods of lighting and heating are common. The same dangers are being constantly faced in many manufacturing establishments, and even in our midst the large departmental store affords a field for some terrible disaster. The immense open area of floor space with piles of light inflamable goods, the open staircases, well holes and elevator shafts, and the crowds of customers and employees, present most favorable conditions for a dreadful holocust. If we wish to retain that part of higher civilization that insists upon the value of human life, something more must be done to protect both public and employees. There is a financial as well as a humanitarian aspect to the matter. When we are informed that about 78 per cent. of the loss by fire during 1907 was caused by reason of the open stairways, elevators or light shafts, it is business folly to go on heedlessly providing more facilities for conflagration.

The question of limiting the height of buildings to some relationship to the width of the street on which they face, is one that should receive discussion and pronouncement upon by this body. The unfairness of allowing anyone to literally put the surrounding property owners into the shade, while he utilizes their property area to give lighting scope to the upper part of his building, is an ethical question that can be discerned by all. But the artistic, sanitary and constructional sides of the question should be pronounced upon by men who are able to form some sound technical opinion."

Mr. Gordon then called attention to the matter of expert evidence given by architects in the courts, recommending that the association should co-operate with other professional business men in a movement seeking to have all professional experts who give evidence in court appointed by a judge and thus placed in a perfectly impartial attitude. Mr. Gordon dealt then with the matter of the compatibility of the dual position occupied by architects who act also as contractors, suggesting that there should be a by-law of the association dealing with the matter. He also suggested a by-law to the effect that "No member shall accept direct or indircet compensation for services rendered in the practice of his profession other than the commission received from his client." These two proposals were adopted by the association subsequently. Mr. Gordon called some attention to the matter of architects canvassing for work, and deprecated it as a serious menace to the standard of the profession.

The Duty on Foreign Plans.

The president dealt at some length with the matter of the employment of foreign architects upon work in Canada. In this connection he said: "When we see Canadian buildings planned by foreign architects, which embody neither good planning nor artistic appearance, we cannot but feel hurt. Private individuals may claim the right to go where they like for their designs, but even in such a case it is poor business and poorer loyalty to pass by those in the community where they have made their wealth and employ outsiders. But no adequate word of excuse can be given by institutions which are dependent upon the Canadian public for their capital and business, when they pass by Canadian architects and employ foreigners. In the early days the Ontario Government was a chief sinner in this respect, with the unfortunate results that still point a warning in Queen's Park. Their bad example was followed by institutions which emblazon the word Canada or Canadian in their name. Rather a misnomer when they had important buildings to erect. Since then each year we are treated to some example of imported architecture. Even such institutions as the Y.M.C.A., which are so dependent upon the good-will of the community, forget what is due to their constituency and import United States architectural service. I question, however, whether import is the right term, for in a great many cases such plans are introduced to this country without paying duty. The Canadian architect is taxed by the Government on nearly all the things that go to make up his business outfit or his living expenses, while the United States competitor is allowed to introduce his productions free. A method which is now being used to avoid payment of duty is to employ some Canadian as associated architect and issue the plans from his office. It is not only the Canadian architects that suffer. For it is the common practice of United States architects to import their own contractors and specify United States goods wherever possible. The owner of the building suffers, for he gets a more expensive building and one no better planned or designed than many Canadian architects could provide. The only people who benefit are the United States Architects, contractors and supply men, who rejoice to keep up the fiction that "Far-off hills are green" and to prove the proverb that "No prophet is without honor save in his own country." However, after all, the better part of our progress depends upon our own endeavors, so despite all the handicaps, Canadian architects are winning out and Canadian architecture is advancing."

In conclusion Mr. Gordon referred to the formation of chapters of the association and the activity among the members, which augurs well for the improvement of the profession. He believed that whatever might be the special standing of the Ontario Association of Architects in the future it would be made increasingly a channel of professional help to its members and a powerful factor in the uplift of architecture in the province.

Will Obtain Thinner Walls.

The "Manchester Guardian" in a recent issue speaks of the benefits that will be derived from a bill going through the British Parliament which will allow builders in Manchester to secure requisite strength in walls thinner than those they now make of brick. The object is to use reinforced concrete, the advantages of which are now so widely recognized that other municipalities are asking Parliament to give them powers like those being sought by Manchester. Government buildings, which are exempt from local laws, have already been so constructed.

Recent Legal Decisions

Negligence of an Employer.—In the Ontario Court of Appeal judgment was recently given in the case of an appeal from the decision of a Divisional Court affirming the judgment of Judge McMahon in the case of Dagg v. McLaughlin. The plaintiff was a workman in the employment of the defendant who was the contractor for the construction of a subway under the tracks of the Grand Trunk Railway at the Bank street crossing, Ottawa, Ont. He was run over and injured by a loaded dump car of which he was in charge, and alleged that the accident was a result of the negligent system which the defendant had adopted for hauling cars, and the absence of necessary precautions for the protection of workmen. The evidence, according to the decision of the Court of Appeal, showed that there had been negligence on the part of the defendant and that his system was a dangerous one. The court sustained the judgment of the Divisional Court and of the trial judge and dismissed the appeal.

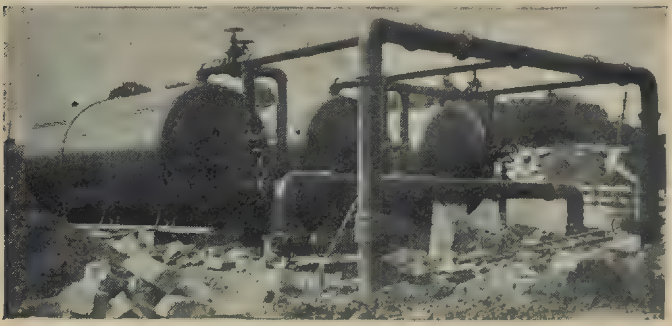
Damages Resulting from Highway Improvements.—In the Court of Appeal for Ontario judgment was recently given by Judge Garrow in an appeal from an order and decision of a Divisional Court affirming the judgment of Judge Anglin in the case of Rudd v. the town of Arnprior. The action was to recover damages to property by reason of the alleged negligent construction of certain highways and drains causing a flood which occurred during a thunder storm and resulted in the collapse of a building. Judge Anglin had held that the plaintiff had established a right to recover some damages, but not the main damages claimed. The building was constructed on a hillside and over a gulley down which the surface water from the upper lands must in the natural condition have flowed in considerable quantity. At the front of the plaintaiff's house Madawaska street had been filled up previously, but a space had been left between it and the plaintiff's house, of about 18 inches under the side highway, which was left open and which was in some places 10 feet deep, down which water must always have flowed. In 1905 and 1906 this space was filled up by the defendants with clay. This was done presumably at the plaintiff's express request. The only actionable result, Judge Garrow said, would be that caused by the excess of water brought to the premises by the street improvements. To separate this from the injurious result of the ordinary flow of water was a difficult if not an impossible task. Judge Garrow was therefore of the opinion that by fixing the damages at $100, substantial justice would be done, and with this variation in the Divisional Court order he affirmed the judgment of Judge Anglin.

Right of Way to Brick Yards.—Judge Anglin gave judgment recently dismissing the action of the Toronto, Hamilton and Buffalo Railway Company v. Simpson Brick Company for an injunction restraining the defendants from trespassing on the plaintiff's right of way and railway tracks. The defendants occupy a brick yard in Hamilton, Ont., on the north side of the railway line and have a private lane or right of way 30 feet in width over the property lying to the south of the railway This land leads to Aberdeen avenue and is the only means of access from the defendants' brick yard to a public highway. To reach this lane they use a crossing over the railway, thus constituting the trespass complained of. The evidence showed that the premises used by the defendants as a brick yard had been in use as a brick yard for 25 years before the railway was built. Judge Anglin stated that the evidence had not at all convinced him that the use by the defendants of this crossing was inconsistent with the safe operation of the railway. He therefore dismissed the action of the the plaintiffs with costs.

Responsibility for Repair of a Highway.—Chief Justice Moss recently gave judgment in the case of an appeal from the decision of the order of a Divisional Court of Ontario reversing the judgment in the trial in the case of Pow v. the Township of West Oxford. The Divisional Court had given judgment for the plaintiff for $1,800 and costs as damages for the death of Alexander Pow, caused by being thrown out of a carriage, owing, as alleged, to the highway being out of repair. The only question, according to the judgment, was whether the defendants or the municipality were responsible. Chief Justice Moss held that this point was sufficiently clear according to the various enactments which had been passed bearing upon the question, and that the maintenance of the road under consideration was the duty of the township and not of the county. He was of the opinion that the order of the Divisional Court should be upheld.

An Interesting Mechanical Filtration Plant.

The city of Stratford, Ont., has recently installed a mechanical filtration plant, which presents several interesting features An illustration of the plant, before the house was built over it, is published herewith. The following description has been prepared especially for the "Contract Record" by Mr. J. Davis Barnett, chairman of the water commissioners:



Mechanical Filtration Plant, Stratford, Ont.

The city waterworks commissioners believe they saved materially in the cost of installing the heavy work of this plant by having large elbow room for the workmen, and freedom for locating and changing the blocks and tackle with which the three large steel tanks, 8 feet x 20 feet, were hauled into position on their concrete foundations and cast-iron saddles. There were two rising mains from the pump house, and the tanks are located above and between them; so that—feeding the city through either main—delivery can be made into the whole or any number of the filtration tanks; or—from the whole—or any one tank—into either or both of the mains. Also, below ground, and not shown in the illustration, are straight-way by-pass valves, permitting the water to go through the rising mains direct from pump to city, if any part of the filtration equipment should be accidentally out of order, when the demand came for a large supply of water to fight fire.

The tanks are designed for purifying at the rate of a million and a half gallons per day, or three times the normal daily demand averaged over the whole of last November. They have performed this duty satisfactorily under test In operation, the unfiltered water enters the tank by the high water cast-iron pipes, and the filtered water exits into either or both the mains, by way of the low level pipes, just above the floor. When washing out, the dirt escapes to the drains down by the upright pipes to the right of each tank. These upright drain pipes are cut off, short of the floor, some six or eight inches, and deliver into open funnels or hoppers leading direct to the tile sewer, so that the condition (color) of this escaping effluent is under the eye of the man controlling the washout valves.

There is a depth of 3½ feet of filtering material in each tank, consisting of crushed quartz—varying from about 5-16 to 3-8 cube at bottom, to quite a fine sand at the top. This material rearranges itself in proper position, and without measurable waste of sand, if the washing-out back pressure is not allowed to go over 40 pounds. Is it not a matter for regret that with the enormous amount of this stone which Canada possesses, crushed-quartz should have to be purchased outside the Dominion, and some 500 miles of freightage paid upon it?

As is common with all mechanical filtration, a small amount of one of the many forms of alum is used to deposit a flocculent coating on top of the fine sand, forming one of the best of filtering mediums. This material is dissolved in an open 2-foot cube box, gravitating into a lower open reservoir or mixer of the same size, where its strength (density) can be tested by a hygrometer. From thence it gravitates to an impulse-pump, at floor level in pump house, whose strokes always correspond exactly with those of the main pump, so that this supply varies with the variation of the main pump. As its delivery is into the main suction pipe, this fluid gets well mixed in passing through the pump barrel and valves, on its way to the perforated distributing pipes at the top, inside the tanks.

It is very improbable that the sand—under these conditions, will become charged with bacteria; but if suspicion is ever aroused of such a state, it is arranged that the sand can be drained, and full-pressure boiler steam passed upward through the quartz (in the same way as the washout water), easily raising the whole to 212 deg., a bacteria killing temperature.

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The metal work was by Park Bros., Chatham, erected by P. McNab, of the Stratford water works. The whole plant was designed by J. Davis Barnett, M.C. S.C.E.

The development of practical methods for the handling and treatment of plastic materials is well nigh a lost art, and one which has a great future before it. In fact, we are only making a new beginning in this line, and the best obtainable knowledge in this direction to-day is merely a primer, compared with all that must be brought out before the use of plastic materials can be fully understood and appreciated.

The Neptune Meter Company, 90 West street, New York, manufacturers of trident-disk and trident-crest water meters, have issued a useful little pocket diary handsomely bound in black leather. In addition to the diary for 1909, the book contains a generous amount of space for memoranda, a number of useful maps and a quantity of extremely handy information.

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Trade Enquiries.

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

2056. Engineering specialties.—A firm of manufacturers' agents and merchants of electrical supplies and general engineering specialties, which they sell to shipyards, collieries, iron works and general engineering trades in the north of England, will consider best merchant terms and illustrated price lists from Canadian manufacturers of suitable lines.

2079. Location of works.—A manufacturing engineer in the north of England contemplates the transference of his business, employing 10 to 15 men, in the making of gas and oil engines, and would like to hear from any municipalities interested.

2088. Metal work, etc.—A Midlands guild of applied arts, making artistic metal work, electrical fittings, lead work, mosaics, stained glass, artistic garden figures, vases, etc., desires to hear from parties in the Dominion having an opening for the class of work in which they are engaged.

2097. Cordage, machinery, etc.—A London firm dealing in ropes, twines and cordage, iron and steel, hardware, metals, machinery, minerals, etc., wishes to extend business with Canada.

2101. Agents.—A north of England firm manufacturing boiler covering and insulation specialties, elastic cement for boiler seams, vulcan cement for joints, etc., is prepared to appoint agents in Canada.

2107. "Dermatine."—A London company manufacturing a special material, "Dermatine," which is used in the manufacture of air pump valves, belting, hose and other appliances, wishes to enter into negotiation with responsible Canadian firms for the sale of "Dermatine" in the Dominion.

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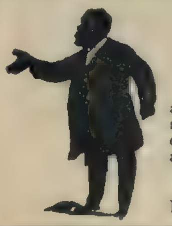

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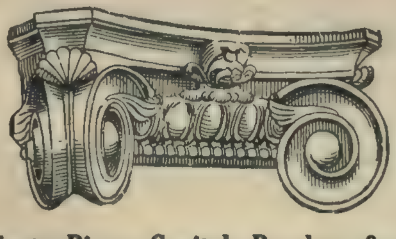

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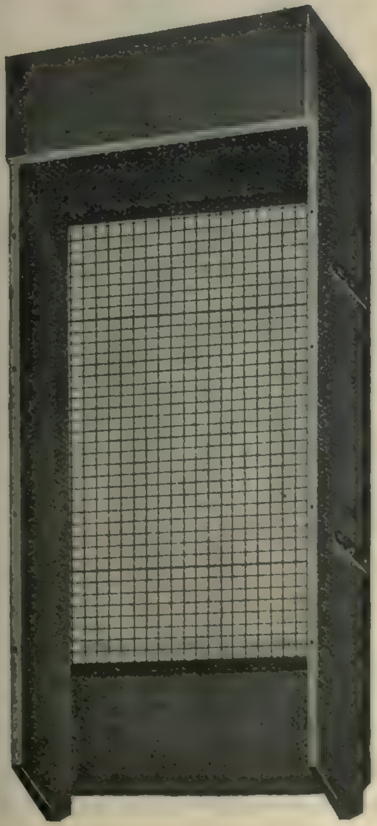

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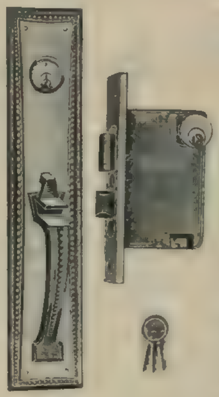

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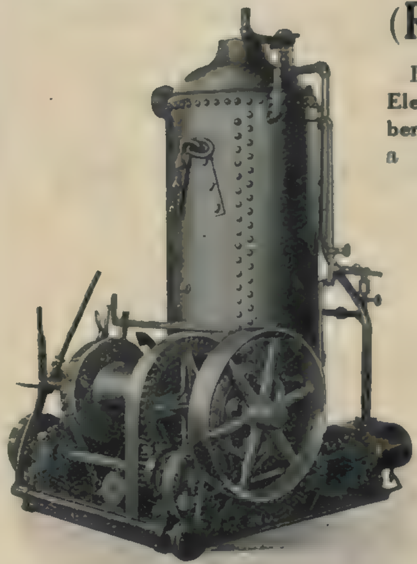

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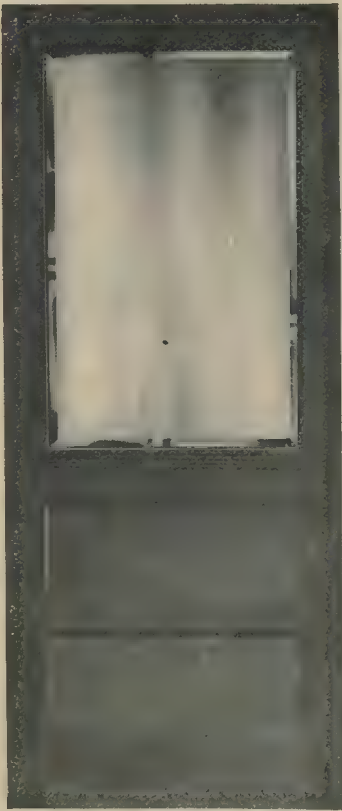

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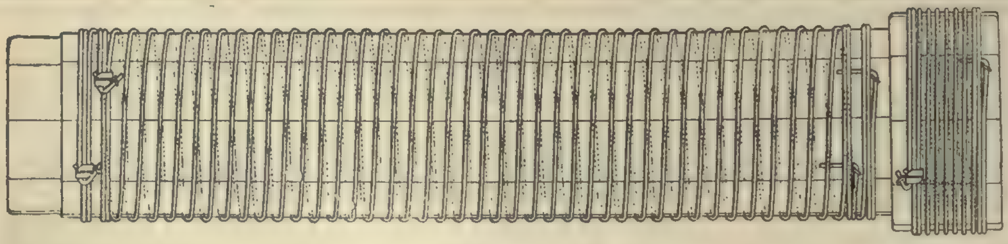

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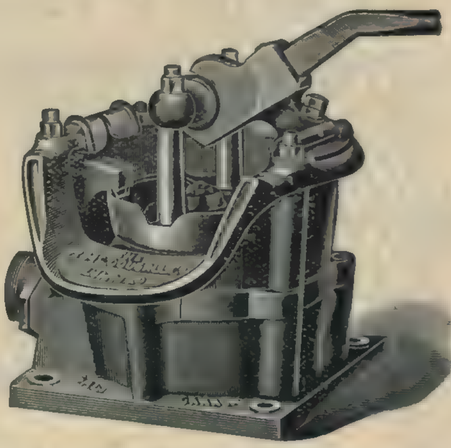

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Aylmer, Que.

The ratepayers have approved a by-law providing for the construction of a waterworks system in this town.

Cobalt, Ont.

Debentures are to be issued for $15,000 for waterworks purposes.

Kildonan, Man.

A by-law will be voted on by the ratepayers on February 15 to issue $20,000 five per cent. 20-year road improvement debentures. Geo. F. Munro is Clerk.

Leamington, Ont.

Tenders addressed to A. Baird, C.E., will be received until February 22nd for the construction of the Whalen drain and works connected therewith in the Township of Malden. Plans and specifications may be seen at the office of Mr. Baird, Engineer-in-charge, this town, or at the office of James Honor, Amherstburg, Ont.

Mimico, Ont.

It is stated that the New Toronto sewerage project, which will entail an expenditure of several thousand dollars, is now under consideration, and that prospects are favorable for its fulfilment.

Montreal, Que.

John R. Barlow, City Surveyor, gives notice of the city's intention to construct sewers on Bishop Lane from Plessis street to a distance of 170 feet eastwards, and on Hochelaga street between Davidson and Joliette streets.

Tenders addressed to L. O. David, City Clerk, will be received until January 29 for the supply and installation of the following at the low level pumping station, Point St. Charles: Steam piping, covering of boilers and steam piping, main electric wiring from switchboard. Specifications may be obtained at the office of the Superintendent of Water Works, City Hall.

Peterboro, Ont.

The by-law to raise $21,500 for street extension which was defeated by the ratepayers will again be submitted at an early date.

Prescott, Ont.

The ratepayers will vote, February 15th, on a by-law to raise $17,500 for extensions to the sewerage system.

Prince Rupert, B.C.

Tenders addressed to F. C. Gamble, Public Works Engineer, will be received until February 1st for the construction of sewerage works at this place. Plans and specifications may be obtained at the office of the Government Agent and of J. H. Bacon, Harbor Engineer, Prince Rupert, B.C.; of the Government Agent at New Westminster; at the office of Mr. R. J. Skinner, Provincial Timber Inspector, Vancouver, and at the Department of Public Works, Victoria.

St. Thomas, Ont.

Tenders will probably be received about April 1 for the proposed septic tanks for the city sewage. James A. Bell is City Engineer; W. B. Doherty, City Clerk.

Toronto, Ont.

City Engineer Rust, instructed by the Board of Control, has prepared a report on the construction of a system of overflow sewers for the city. The total cost is estimated at $726,340.

City Engineer Rust has asked for the following interim appropriations in advance of the estimates: Roadways, $6,000; asphalt repairs, $1,000; sidewalks, $2,000; and general purpose sewer repairs, manholes, contracts, etc., $3,000.

The City Engineer has recommended extensions of water mains on Colma avenue, Dupont street, Lucas street and Binscarth road, and has recommended that a sewer be laid on Grace street, from 1,870 feet north of College to 400 feet south of Bloor, at a cost of $1,900.

Vancouver, B.C.

The ratepayers have approved a by-law to raise $500,000 for sewer improvements and $200,000 for widening streets.

Victoria, B.C.

The ratepayers have approved a by-law to raise $65,000 for the extension of the sewerage system.

Weston, Ont.

Willis Chipman, C.E., 103 Bay street, Toronto, has reported to the town council in reference to the establishment of a system of waterworks. Mr. Chipman recommends an expenditure of $57,000 on the installation of a system, the source of supply to be the Humber river, the water of which is to be pumped into sedimentation basins, thence through mechanical filters and on to a supply tank to be erected at the north end of the village, with a capacity of 100,000 gallons.

Winnipeg, Man.

Tenders closed January 25th with M. Peterson, Secretary, Board of Control, for sewer construction on Lombard avenue, from Main street to the Red river.

At a recent meeting of the Board of Control the Engineer of Construction urged the members to prepare at once for securing an asphalt supply for the coming season.

C. J. Brown, City Clerk, gives notice of the city's intention to carry out certain local improvements, including the following: A sewer in Helen street, from Fleet avenue to Dudley avenue, estimated cost $1,445; a sewer in Dudley avenue, from Helen street to Aynsley street, estimated cost $1,195; a sewer in Hespeler avenue, from Bird's Hill road to Glenwood crescent and northerly on Glenwood crescent to Stewart avenue, estimated cost $5,790; a sewer in Bird's Hill road, from Johnson avenue to northern city limits, estimated cost $5,000; a sewer in Arlington street, from Yarwood avenue to Notre Dame avenue, estimated cost $1,251; a sewer in Brant street, from Elgin avenue to Alexander avenue, estimated cost $2,447; a sewer in Crawford avenue, from Mac street to Scotia street, estimated cost $2,576.

AWARDED.

Fort William, Ont.

The Board of Water Commissioners have awarded to the Canadian Iron Corporation, of this city, a contract for 3,500 feet of iron water pipe.

Hamilton, Ont.

The Hamilton Bay Improvement Company have been awarded the contract for the pipe driving on the extension of the Ferguson avenue and Catharine street sewers at a cost of 27 cents a foot.

Railroads, Bridges and Wharves

Emerson, Man.

The Great Northern Railroad Company have completed a survey for a line from the United States boundary to Winnipeg. Construction work will begin in the spring. The line runs from Emerson, on the east side of Red river, to St. Agathe, where it crosses to the west side, and goes in a northwesterly direction to the terminal property on Ross avenue, Winnipeg.

Hamilton, Ont.

It is reported that the Canadian Northern Railway, which controls the charter of the Toronto & Hamilton Railway, has decided to build a steam system, instead of on electric railway, from Toronto to Buffalo across Hamilton Beach and that the work of construction will be started early in the spring.

London, Ont.

The North Midland Railway Company have announced that surveys for this road have been completed, and it is expected that construction will begin this spring. The line will connect Lucan, Granton, St. Marys, Stratford and London, and will be about 45 miles in length. Capital, $1,000,000. T. H. Lascombe, London, Secretary; A. E. Welch, London, General Manager.

Moose Jaw, Sask.

The Main street bridge is now completed, and it is announced that two more bridges will be constructed immediately. A steel bridge 60 feet long, with 60 feet of wooden approaches, will be erected on Main street, about two miles south of the city. The other bridge will be constructed to span the river east of the Granton school, about thirteen miles southeast of Moose Jaw. This structure will be of steel, 80 feet in length, with one 20 foot wooden approach.

Montreal, Que.

D. R. Murphy, solicitor for the Quebec Oriental Railway Company, gives notice that application will be made to the Dominion Parliament for authority to carry out certain extensions, etc.

New Westminster, B.C.

The Heaps Timber Company, Limited,

are planning to construct a railway, to be operated by either steam or electricity, for the logging of their timber limits located along the west side of Stave river.

Oak Bay, B.C.
At a recent public meeting, the Reeve, Mr. Henderson, drew attention to a number of public works which will be undertaken during the present year. The projects include the erection of bridges across the Thames river, on Cadboro Bay road, and at Beach Drive, Shoal Bay.

Quebec, Que.
Application will be made for the incorporation of the Cabano Railway Company for the construction of a line of railroad from Long Lake to Cabano.

It is stated that location surveys have been made for an extension of the Quebec, Montreal & Southern Railway from Ste. Philomene, Que., east to Quebec bridge, 41 miles, but that contracts will not be let until the completion of the Quebec bridge is an assured fact. It is tsated that surveys also have been made for extensions to Levis, an additional seven miles; also for a branch from Becaucourt to St. Lawrence River, four miles. F. D. Anthony, Montreal, is Chief Engineer.

Sudbury, Ont.
President Mackenzie, of the C. N. R., recently announced that his company would proceed with the construction of a line along the north shore of Lake Superior, connecting western lines which now reach Port Arthur with the Company's Ontario lines at Sudbury. Construction will probably be commenced this year.

Toronto, Ont.
A recommendation will be submitted to the City Council by Park Commissioner Wilson for the construction of a steel and concrete bridge at the Island, to connect Centre Island and Hanlan's Point. Mr. Wilson also has in view the construction of several other bridges across the various lagoons.

Victoria, B.C.
The British Columbia Southern Railway Company are seeking authority for the construction of a branch line from Michael in a northerly direction through Kananaskis Pass to the junction of the C. P. R. at Kananaskis, a distance of about 120 miles; also for other extensions.

Vancouver, B.C.
The Burrard, Westminster, Boundary Railway & Navigation Company are applying for authority to construct certain branch lines and for the extension of certain time limits.

Winnipeg, Man.
Tenders closed recently with R. Rogers, Minister of Public Works, for the construction of a timber Howe bridge, on stone filled crib work pier, and abutments over the Fork river.

Public Buildings, Churches, Schools, etc.

Banff, Alta.
The Dominion Government have donated a site for the erection of a new club house for the Alpine Club of Canada.

Calgary, Alta.
The Lacombe Roman Catholic School are asking tenders for $65,000 worth of school debentures, to be issued at once, for the purpose of purchasing site and erecting an eight room school, also securing sites and erecting one or two ward schools.

Hamilton, Ont.
The Wentworth County Council have been notified that a House of Refuge must be erected before January 1st next.

Montreal, Que.
The estimated cost of the new club house to be erected by the M. A. A. A. is stated to be $50,000.

New Westminster, B.C.
The School Board are contemplating the erection of a school building at Sapperton.

Ottawa, Ont.
Tenders will be called immediately for the erection of a new building at Rockliffe Park for Ashbury College. Plans have been prepared by Weeks & Keefer. The directors of the college include W. H. Rowley, J. F. Orde, Col. Irwin, Rev. G. P. Woolcombe and J. W. Woods.

The Separate School Board are contemplating the issue of debentures for the erection of two new schools in Victoria ward.

The Knox church committee are considering a proposal to secure a site for the erection of a new church. Rev. Dr. Ramsay is pastor.

At a recent meeting of the Canadian and Imperial Service Association, it was announced that an offer had been received of a lot in the central portion of the city upon which would be erected a $30,000 building, which would be given over to the Association.

Port Arthur, Ont.
Tenders will be taken at once for the erection of a new Collegiate Institute, to be of stone construction and to cost $60,000.

Regina, Sask.
Tenders close February 1 for general construction of the Regina General Hospital. Myer J. Strum, 84 La Salle St, Chicago, Ill., architect; J. Kelso Hunter, City Clerk.

Rodney, Ont.
At a joint meeting of the councils of Aldborough township and Rodney, D. McLean, reeve of Aldborough, and J. J. Mistele, reeve of Rodney, were appointed to secure plans and estimates for the erection of a new town hall here.

St. Thomas, Ont.
Plans prepared by Architect Darrach for the erection of a two storey brick school building to be erected at Paddon's, at a cost of $4,600, have been accepted.

Streetsville, Ont.
Tenders addressed to Rev. G. C. Balfour will be received until February 5th for the rebuilding of Eden Methodist Church.

Toronto, Ont.
Tenders addressed to Burke, Horwood & White, architects, 28 Toronto street, will be received until January 27th for the plumbing, heating and wiring of the Dental College, corner of College and Huron streets.

Mayor Oliver has received a communication from Hon. Wm. Pugsley, Minister of Public Works, giving assurance that the matter of a new distributing post office will have the immediate attention of the authorities.

The Parkdale Congregational Church, corner of Brock avenue and Maple grove, was badly damaged by fire last week.

Vancouver, B.C.
Plans have been prepared for an addition to the premises of the St. Mary's Catholic Literary and Athletic Association, corner of Bathurst and Adelaide streets, to cost approximately $20,000. The president, Mr. D. A. Carey, states that building operations will be commenced in the near future.

The ratepayers have approved a by-law to raise $70,000 for an infectious hospital, $187,000 for school purposes, and $75,000 for the construction of a garbage destructor.

The permit has been issued for the erection of the Sixth Avenue Methodist Church. Estimated cost $10,500.

Victoria, B.C.
The ratepayers have approved a by-law to raise $65,000 for improving the school buildings. The measure to spend $35,000 on the city hall was defeated.

Waterloo, Ont.
Mr. Hunter, of the Department of Public Works, has completed the purchase of a site at the corner of King and Duke streets for the erection of a new public building.

Winnipeg, Man.
At the annual meeting of the St. Augustine Presbyterian Church it was decided to erect a new Sunday school building at a cost of $18,000.

Woodstock, N.B.
Plans, specifications and estimates addressed to H. A. Phillips, Chairman, Building Committee, will be received until February 20th for the construction of a brick court house in this town. The building will be erected this summer.

AWARDED.

Sherbrooke, Que.
The main switchboard, distributing boards and cabinets for the new drill hall at Sherbrooke, Que., are being supplied by the Hill Electric Manufacturing Company, Montreal.

Residences

Montreal, Que.
J. J. Brown & Son will erect a new apartment house on Mayor street, opposite St. James Methodist Church, at a cost of $25,000. The property is 51 feet by 83 feet, and the building will consist of eighteen apartments of three and four rooms with bathroom attached. Mr. W. Mickle, the present proprietor of the property, will erect the building, commencing operations on May 1st.

Niagara Falls, Ont.
The dwellings of J. Dobran and Mr. Sheppard were destroyed by fire last week at a total loss of about $4,000.

New Westminster, B.C.
The residence of Frank Geald, Fourteenth street and Seventh avenue, was destroyed by fire last week at a loss of $3,000.

Toronto, Ont.
Recent building permits include: John Walker, pair semi-detached two storey brick dwellings, Garden avenue, $4,000; Henry C. Stevens, two and a half storey brick dwelling, Jameson avenue, $3,000; John Mulhorn, two pairs semi-detached

two storey frame and stucco dwellings, Lappin avenue, $4,000; F. W. and H. J. King, pair semi-detached two storey and attic brick dwellings, Herrick street, $4,000; Geo. A. Lowe, pair semi-detached two and a half storey brick dwellings, Huron street, $5,000; R. B. Storey, pair semi-detached two and a half storey brick dwellings, Marmaduke street, $5,000; R. P. Powell, four pairs semi-detached two storey brick dwellings, corner Ossington avenue and Hallam street, $20,000; C. Coldwell and A. Minnett, pair semi-detached two storey roughcast dwellings, brick fronts, Frizzell avenue, $2,000.

Vancouver, B.C.

Recent building permits include: Geo. Johnston, frame dwelling, Sixteenth avenue, $2,000; J. V. and G. Lightheart, six frame dwellings, Bidwell and Alberni streets, $15,000; R. Robertson, frame dwelling, Eighth avenue, $1,800; J. Abbott, frame dwelling, Fifth avenue, $1,500; Wm. Peddler, frame dwelling, Twelfth avenue, $1,500; J. F. Strong, frame cottage, Fifth avenue, $3,000; J. Anderson, frame cottage, First avenue, $1,500; J. E. Wright, dwelling, Eighth avenue, $2,000; F. Kelly, dwelling, Sixth avenue, $2,500; R. J. Coleman, two houses, Lorne street, $2,800; M. A. Coleman, two dwellings, Eleventh avenue, $1,400; Fred Kilby, frame dwelling, Sixth avenue, $2,500; J. H. Baker, frame dwelling, Dufferin street, $1,500; S. Jarvis, frame stable, Cordova street, $2,000.

Business Buildings and Industrial Plants

Chilliwack, B.C.

The Canada Chemical & Wood Distilling Company, Limited, capitalized at $20,000, are applying for incorporation. Arrangements are now being made for the erection of a building and the installation of machinery.

Fort William, Ont.

It is stated that the City Council are considering a proposition for the erection of a large new elevator.

Hamilton, Ont.

The warehouse of the Standard Chemical Company, Limited, was badly damaged by fire. The head office of the Standard Chemical Company is at Toronto.

Killarney, Man.

The building of George Hoar was destroyed by fire last week at a loss of $10,000.

Kingsmill, Ont.

It is stated that a company is being organized for the erection of a new building for the Northwood cheese factory.

London, Ont.

Tenders closed January 25th with W. G. Murray, architect, Masonic Temple Building, for the construction of vaults and alterations, and the painting of the exterior of the Oddfellows' Buildings, the property of the London Loan & Savings Company.

The Canadian Packing Company have secured the Flavelle property on the Grand Trunk, between Maitland and William streets. It is understood that they will immediately make application for a franchise to establish a public abattoir. Mr. Rechnitzer, of the Canadian Packing Company, may be addressed.

Montreal, Que.

The premises of the Canadian Asbestos Company were destroyed by fire last week at an estimated loss of $40,000.

It is stated that the C. P. R. will extensively remodel the Place Viger passenger and freight sheds.

North Bay, Ont.

The building owned by Begg Bros., dry goods merchants, was destroyed by fire last week at a loss of about $4,000.

Quebec, Que.

The Fashion Craft building was destroyed by fire last week at a total loss of about $40,000.

Niagara Falls, Ont.

Tenders were taken last week for repairing the building of Richard Shepherd, recently destroyed by fire.

Regina, Sask.

The storehouses of the C. P. R. were badly damaged by fire last week.

Sydney, C.B.

The Scotia Fire Brick Company, Limited, have taken over the deposits at Coxheath and will erect a large manufacturing plant. Mr. E. E. Shaw, of Shaw & Mason, Limited, Sydney, C.B., is president.
Limited.

Sault Ste. Marie, Ont.

It is stated that six millions of British capital are interested in a project for the construction of a crucible steel plant and for a plant to deal with the scrap from the steel mills. Mr. W. K. Whigham, of London, Eng., a director of the Lake Superior Corporation, recently had an interview with Sir James Whitney and members of the Government. The Algoma Central Railway and the Manitoulin Island Railway will be pushed to completion.

Trenholmville, Que.

It is stated that a factory will be erected here by Sherbrooke men in the spring.

Toronto, Ont.

Col. J. B. MacLean has made an application to the Board of Control for a permit to erect a printing and publishing house on University avenue, south of Anderson street. The controllers will inspect the site.

A permit has been issued to W. Waters for the erection of a pair of semi-detached stores and dwellings on the southwest corner of Follis and Manning avenues, at a cost of $5,700.

G. H. Boven will erect a two storey brick store and dwelling on Bloor street west at a cost of $2,500.

A three storey brick store and dwelling will be erected on College street, near Gladstone avenue, by M. A. Hunter, at a cost of $5,000.

The coal sheds of T. Burns & Company were partially destroyed by fire last week at a total loss of about $25,000.

Tenders addressed to F. H. Herbert, architect, 65 Adelaide street east, will be received until January 30th for the brick and concrete work, steel and iron, carpentry, painting and roofing reqiured in the erection of new warehouses, storage sheds and workshops on Macdonnell avenue for the Bigley Manufacturing Company,

Victoria, B.C.

The Western Canada Pulp & Paper Company, Limited, capitalized at $1,500,000, are considering the immediate erection of a large pulp and paper mill on Quatsino Sound.

Tenders closed recently with F. M. Rattenbury, architect, for the erection of a brick office building on Fort street for Mr. D. R. Ker.

Vancouver, B.C.

The Canadian Industrial Company will erect a large paper and pulp mill at a site on the Powell river. Mr. A. Carmichael, hydraulic engineer and contractor, is now engaged upon plans.

Building operations will be commenced at the earliest date possible on the new buildings of the Hygienic Dairy Farm. An order for 500,000 shingles was placed last week, and 200 loads of sand and gravel for making the concrete have recently been delivered.

A brick store building will be erected on Harris street by Campbell and Grill at a cost of $3,250.

Work has commenced upon the remodeling of the Sam Kee block on Carrall street, which will be occupied by the British Columbia Electric Railway Company during the demolition of their old quarters and the reconstruction of a new $200,000 tram depot and office building.

C. A. McGilivray, of Bellingham, Wash., has purchased a site on the corner of Strathcona and Boundary avenues for the erection of a large saw mill.

The Vancouver Pipe & Foundry Company are contemplating the construction of larger quarters in the southern part of Hastings townsite. The proposed new foundry will be 150 feet by 175 feet. Mr. Arthur Gray may be addressed.

Winnipeg, Man.

The Manitoba Iron Works are planning an addition to their buildings on Logan avenue by the construction of an extension. 450 feet by 130 feet, at an initial cost of over $150,000. T. R. Deacon, manager of the company, states that when the addition is completed the capacity of the work will be at least 20,000 tons of steel a year, enabling the construction of the largest bridge spans required.

AWARDED.

Dryden, Ont.

The Stebbins Engineering & Manufacturing Company, Watertown, N.J., have been awarded the contract for the entire equipment of machinery and chemical apparatus required for the Gordon Pulp & Paper Company's 40-ton sulphite plant now in course of construction. Chas. B. Gordon is Secretary-Treasurer and General Manager of the Gordon Pulp & Paper Company.

Vancouver, B.C.

The contract for the steel in the construction of the 13-storey office building to be erected at the corner of Hastings and Cambie streets by the Dominion Trust Company has been awarded to the Dominion Bridge Company, of Montreal.

Power Plants, Electricity and Telephones

Calgary, Alta.

Engineers' estimates show that the municipal electric railway system to be constructed here this spring will cost $478,000.

Fernie, B.C.

The Kootenay Telephone Lines, Limited, Cranbrook, B.C., are installing a system to replace the one destroyed by the late fire. In the early spring the company will proceed with the construction of additional long distance lines throughout the East Kootenay district.

Edmonton, Alta.

The managers of the municipal electric light plant contemplate installing an addi-

Tenders and For Sale Department

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City of Brantford

Sewer Construction

Sealed tenders addressed to John Moffat, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock noon on

Thursday, February 11th, 1909,

or the furnishing and laying of about 2,250 feet of 12 inch extra strength Sewer Pipe and 635 feet of 12 inch Cast Iron Pipe, together with 11 manholes; greatest cut 32 feet; average cut 17½ feet.

Plans and specifications may be seen and instructions to bidders, and forms of tender obtained at the City Engineer's Office.

Each tender must be accompanied by a marked cheque for 5 per cent of the amount of the tender.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.

City Engineer's Office,
Brantford, January 18th, 1909. 5

Tenders for Bridge

Tenders will be received by the undersigned up to 12 o'clock noon, on TUESDAY, THE 26TH DAY OF JANUARY, 1909, for the erection of a Steel Bridge over the Saugeen River at a point about 2½ miles East of Port Elgin. Bridge is about 300 feet long. Cement pier in centre to be built, the abutments are now erected. Plans may be seen at office of County Clerk at Walkerton, or tenderers may submit their own plans and specifications. Deposit of ten per cent. to accompany each tender which will be returned if tender not accepted. The lowest or any tender not necessarily accepted

Dated this 29th day of December, 1909,

P. A. MALCOMSON,
County Clerk, Walkerton, Ont.

4

City of Regina

Tenders for Regina General Hospital

The undersigned will receive sealed tenders on behalf of the Corporation of the City of Regina, marked "Tender for Regina General Hospital" up till five o'clock p.m., on MONDAY, 1ST FEBRUARY, 1909, for the construction of the new Regina General Hospital, according to plans and specifications prepared by Meyer J. Sturm, Architect, 84 La Salle St., Chicago, U.S.A., which may be seen at the office of the City Clerk, Regina, as well as at the Builders' Exchange, Winnipeg.

Each tender to be accompanied by a certified cheque drawn upon any chartered bank of Canada payable to the order of the "City of Regina" to the extent of $5,000.00, which will be forfeited should the contractor fail to enter into a satisfactory contract when notified to do so, and which will be returned to the unsuccessful bidders when the contract is signed.

The contractor whose tender is accepted will be required to furnish a bond for $25,000.00 by a Canadian or British Guarantee Company.

The City Council reserve the right to reject any or all tenders, and to waive any defects or irregularities therein.

A deposit of $10.00 must accompany any application to remove plans snd specifications from the City Clerk's office and such privilege will only be granted to bona fide contractors for the entire work.

J. KELSO HUNTER,
City Clerk.

Regina, Sask., 28th December, 1908. 4

Debentures for Sale

The town of Gananoque has issued Local Improvement Debentures for $19,621, to fall due on January 1, 1929, and bearing interest from January 1, 1909, at the rate of 5 per cent. per annum, payable at the Treasurer's office in Gananoque on January 1 in each year. First interest payment January 1, 1910.

Tenders for the above debentures addressed to the undersigned will be received until TUESDAY, FEBRUARY 2, 1909.

For further information address

S. McCAMMON, Town Clerk.

Gananoque, January 14, 1909. 4

NOW LISTEN

Nine large factories have been built in Welland in the past two years. The population has increased from 1,700 to about 5,000. Five other big factories will start construction as soon as building weather permits. These five factories will employ collectively about 2,000 more people. We need 400 houses to put these people in. Negotiations are on with several other factories for locations. Figure this out for yourself and then get busy. Welland is the safest place on the map to invest your money and land is so cheap, it's a shame to take it at the money.

House builders and contractors sit up and take notice. Get here early.

B. J. McCORMICK,
Welland

4

City of Calgary

Tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned, marked "Tender for Boiler and Generator," until the 18TH DAY OF FEBRUARY, NEXT, at 12 o'clock noon, for supplying to the City the following:

3 Water Tube Boilers equivalent to 1,000 H.P., with piping and induced draft system for 2,500 H.P.

Also 1 500 K.W. Generator connected to a 750 H.P. High Speed Engine for Railway System, with condensor, switchboard, etc.

A certified check on a chartered bank in Canada for 2½ per cent. of the amount must accompany each tender—Separate offers may be made for any of the items set out herein.

Plans and specifications can be had on application to the City Engineer, Calgary, Alta.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary, January 20th, 1909.

City of Ottawa

Construction of Re-Inforced Concrete Grand Stand

Notice to Contractors

Sealed tenders addressed to the Secretary of the Central Canada Exhibition Association, 26 Sparks St., Ottawa, will be received by registered post only up to 12 o'clock noon, FRIDAY, FEBRUARY 12TH, 1909, endorsed "Tender for Grand Stand," for the construction complete of a re-inforced concrete Grand Stand to be erected on the grounds of the Central Canada Exhibition Association, Ottawa.

For terms of tender and all information, apply to the undersigned.

E. McMAHON
Secretary, C.C E.A.
26 Sparks St., Ottawa

Ottawa, January 21st, 1909. 4

Debentures for Sale

Town of Waterloo

Tenders addressed to the undersigned will be received up to MONDAY, 1ST FEBRUARY, at 7 o'clock p.m., for the purchase of the following Debentures:

School Debentures, $15,000, 20 instalments, interest 4½ per cent.

Bridge Debentures, $5,000, 20 instalments, interest 4½ per cent.

Cement Walk, Local Improvement Debentures, $2,445.89, 20 instalments, interest 4½ per cent.

Sewer Local Improvement Debentures $4,360.05, 30 instalments, interest 4½ per cent.

Isolation Hospital Debentures, $3,000, 10 instalments, interest 4½ per cent.

For further information address

A. B. McBRIDE, Town Clerk,
Waterloo.

4

Tenders

Concrete Walks

Sealed tenders endorsed on the envelope "Tenders for Concrete Walks" and addressed to J. F. Cass, Reeve, Winchester, Ont., will be received up till 8 o'clock p.m., of FRIDAY, FEBRUARY 5TH, 1909, for the construction of:

18,200 Square Feet of Concrete Sidewalks

Plans and specifications may be seen at the office of the undersigned Engineer.

The lowest or any tender not necessarily accepted.

A marked cheque for the sum of $150.00 payable to the Treasurer of the Village of Winchester, must accompany each tender.

J. F. CASS,
Reeve

THOS. H. DUNN
Engineer

Winchester, January 19th, 1909. 4

City of Calgary

Tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned marked "Tender for Street Railway Material," until the 18TH DAY OF FEBRUARY NEXT, 12 o'clock noon, for supplying to the City the following:

Covering approximately:

397 long tons No. 80 A. S. C. E. steel rails
746 " No. 60 " "
Together with certain special work, also spikes, bonds, tie plates.
Angle irons, track bolts, ties, etc.
12 standard street railway cars.
One street railway sprinkler.
" " " sweeper.

OVERHEAD CONSTRUCTION.

Steel span wire poles 30′ and 35′ three sections.
Cedar poles.
12.5 miles of 2.0 trolley wire.
10.2 miles of 3.0 feed wire.
Span wire.
Hangers, insulators, and conical strain insulators.
Ears.
Cross-overs and trolley frogs.

Bids will be received upon the entire schedule or any item of the same. A marked cheque covering 5 per cent up to $10,000 and 2½ per cent over and above this sum of the amount bid will be required to accompany each and every tender.

Full particulars and specifications will be supplied at the City Engineer's Office.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary, January 20th, 1909.

Notice to Contractors

The Alvinston School Board contemplates installing either a

Hot Water or Steam System of Heating

for the use of the Alvinston School. Tenderers will please send plans and specifications when tendering. Board meets the first Friday of every month.

ALEX. M. PHAIL,
Secretary School Board,
6 Alvinston, Ont.

Tenders—To Contractors

Tenders will be received up to the 30th inst. for the Brick and Concrete Work, Steel and Iron, Carpenter Work, Painting and Roofing required in erection of

New Warehouses, Storage Sheds and Workshops

on Macdonell Avenue, for THE BIGLEY MFG. CO., LIMITED.

Plans and all particulars at office of

F. H. HERBERT, Architect,
65 Adelaide Street East.

Tenders for Hardware

Separate tenders for Hardware to the buildings mentioned below will be received by registered post only addressed to the undersigned up to noon on

Tuesday, 2nd February, 1909.

1. Public Bath House—Stephanie Place.
2. Wagon House—Agnes Street.

Plans and specifications may be seen and forms of tenders and all information obtained at the office of the City Architect, Toronto.

Envelopes containing tenders must be plainly marked on the outside as to contents. The usual conditions relating to tendering as prescribed by City By-law must be strictly complied with or tenders may not be entertained.

The lowest or any tender not necessarily accepted.

JOSEPH OLIVER (Mayor),
Chairman Board of Control.
City Hall, Toronto,
January, 190 .

tional 1,000 kw. generator and engine. A. W. Ormsby is Superintendent.

Fort William, Ont.

Plans are being considered by the Board of Water, Light & Telephone Commissioners for general extensions to the municipal electric light plant, for which $10,000 has been voted. Chas. J. Moors is Superintendent.

Lethbridge, Alta.

Tenders will be received until March 1 by Geo. Robinson, Secretary-Treasurer, for constructing a municipal power plant here, to include boilers, and accessories, economizer, feed pumps, mechanical draft, pipe work and valves, steam turbine generator, steam engine generator, re-erection of steam engines, condensing sets, crane, switchboards, etc., motor generators and transformers, building steel work, etc. Smith, Kerry & Chace, Confederation Life Building., Toronto, Ont., Engineers.

Montreal, Que.

The Saraguay Electric & Water Company will construct about 2 miles of transmission lines this year. E. Champagne, Montreal, is manager.

MacLeod, Alta.

Tenders are now being asked for two new boilers and a 260 kw. direct-connected generator for the municipal electric light plant. G. H. Altham is superintendent.

Port Hope, Ont.

Colonel Ward, K.C., of this town, will apply for the incorporation of the Cobourg, Port Hope & Havelock Electric Railway Company.

Sydney, C.B.

The East Bay Tramway Company are asking the Cape Breton County Council for financial assistance in the construction of a line of electric railway which they propose building from this city to East Bay.

Tweed, Ont.

The Tweed Electric Light & Power Company contemplate increasing the output of their plant and will install a 100 kw. 2 or 3 phase generator. J. T. Kissack is Secretary.

Toronto, Ont.

It is expected that tenders for underground cable for the electric distributing plant will be called in about three weeks.

A deputation waited upon the Hon. Frank Cochrane last week to ask the Ontario Government to dam the head waters of the Mississippi river. The deputation consisted of B. Rosamond, ex-M.P. Metcalfe, A. Jamieson, W. H. Stafford and J. W. Wiley, of Almonte, Ont.; G. Moran and B. McHugh, of Arnprior, Ont.; J. B. Brown, Carleton Place, Ont., and T. B. Caldwell and A. C. Caldwell, of Lanark.

Vancouver, B.C.

Alfred Carmichael, hydraulic engineer and contractor, has been examining the water power at a site on the Powell river, where a large paper and pulp mill is to be erected by the Canadian Industrial Company. 5,000 h.p. will be developed at the outset.

AWARDED.

Dryden, Ont.

The Gordon Pulp & Paper Company have closed a contract with the Stebbins Engineering & Manufacturing Company, of Watertown, N.J., for the entire equipment of machinery and apparatus required for their 40-ton sulphite plant now in course of construction. The company has at this point on the Wabigoon river a good water power and mill site, where 5,000 horse-power will be developed under a head of 46 feet. Samuel Nesbitt, Brighton, Ont., is president of the Gordon Pulp & Pawer Company, and Chas. B. Gordon secretary and general manager.

Miscellaneous

Dundalk, Ont.

Tenders close January 30 for the purchase of local improvement debentures for $2,700 at four and a half per cent. for fifteen years. M. W. Ridley, Village Clerk.

Gananoque, Ont.

Tenders close February 2 for $19,621 five per cent. local improvement debentures. S. McCammon, Town Clerk.

Halifax, N.S.

Tenders will be received until February 10 for $105,600 four per cent. school debentures, maturing in 1940. W. L. Brown, City Treasurer.

Kingston, Ont.

Tenders close January 28th with H. B. Craig, City Engineer, for the supply of approximately 5,000 barrels of Portland cement and a quantity of sewer pipe.

London, Ont.

Tenders close February 1st for $76,608 four and a half per cent. ten year local improvement debentures. James S. Bell, City Treasurer.

Tenders addressed to J. S. Bell, City Treasurer, will be received until February 1st for the purchase of $76,608.76 debentures of this city, repayable in ten annual instalments and bearing 4 1-2 per cent. interest. Further particulars may be obtained from Alderman Ferguson, Chairman, Finance Committee, or of the City Treasurer.

Nokomis, Sask.

Tenders close February 1 for $10,000 six per cent. 20 year town improvement debentures. W. A. Armour, Secretary-Treasurer.

Notre Dame de Grace, Que.

Tenders close February 1 for $50,000 four and a half per cent. forty year debentures, with sinking fund. Interest payable half yearly. L. DesCarries, Secretary-Treasurer.

Ottawa, Ont.

Tenders close January 28 for $966,940 four per cent. debentures, about $445,000 are for 20 years, about $417,000 are for 30 years, and about $105,000 for 40 years.

Toronto, Ont.

Tenders for hardware to (1) public bath house, Stephanie place, (2) wagon house, Agnes street, will be received until February 2nd by Joseph Oliver, Chairman, Board of Control.

At a recent meeting of the Riverdale Business Men's Association, it was decided to have plans prepared in connection with the improvement of Ashbridge's Bay and submit the same to the City Council. A committee will also wait upon the council to urge the construction of the proposed spur line for Riverdale.

The Board of Control have decided upon the re-submission of the by-law to spend $135,000 upon an eastern entrance to the fair grounds.

Vancouver, B.C.

By-laws to raise $22,000 for the establishment of a police patrol system and $38,000 for park improvements have been carried by the ratepayers.

AWARDED.

High River, Alta.

Debentures amounting to $48,000, issued for the purchase of a fire engine, the construction of an electric plant and the erection of a town hall, have been awarded to G. A. Stimson & Company, Toronto.

Montreal, Que.

The Fire Committee have awarded to the Canadian Fire Hose Company the contract for $5,000 feet of "Keystone" hose at $1 a foot. W. E. Seagrave Company successfully tendered for the supply of two truck ladders at $2,500 each.

R. L. McAfee, builder, Toronto, has assigned to G. R. Roach.

The business of the City Sash & Door Company, London, Ont., is advertised for sale.

McNabb & McKinney, plumbers, Parry Sound, Ont., have assigned to S. Armstrong.

W. McVicar & Sons, lumber manufacturers, Port Elgin, Ont., have assigned to W. C. Bullock.

The Cannon Granite Company, Limited, Toronto, Ont., have gone into voluntary liquidation. The Union Trust Company, Limited, have been appointed liquidators.

How to Get Rid of Limestone Scum from Brick

Some interesting observations upon the subject of "How to Get Rid of Limestone Scum from Brick" were made at Brantford, Ont., last week in an address given by Mr. John B. Millar, of the Don Valley Brick Works, Toronto, before the convention of Manufacturers of Clay Products. Mr. Millar said:

It is a well known fact that lime in its various combinations is almost universally diffused throughout the earth's crust, with which we, as clay workers, are interested. This varies in the materials used by us from one per cent., or a trifle over, to as high as almost 25 per cent. of lime, and all being used successfully in the manufacture of clay products. Of course, I am not speaking of fire clays. The process of manufacture varies in our different factories, depending on the line of goods we are turning out, but the preparation of the clay in any form demands that more or less water be mixed with the clay to bring it to the proper consistency for our special use. The water used carries large quantities of lime also in some cases, varying considerably, of course, with location and the formation through which it passes. Lime is very seldom entirely absent from either clay or water and frequently they have a high percentage. With this mixture we are asked to deal to-day, so that it may be dried and burned, coming from the kiln unspotted and forever after remaining the same. The theory is correct, I believe (no matter what provess is being used), that after the brick is formed it is necessary to induce in some way a gentle perspiration so that the whole of the moisture contained in the brick is exuded. This in passing off will carry with it many of the impurities that give so much trouble. If in any way this is interfered with, by the heat dropping too low through carelessness on the part of someone, or the temperature becoming too high, thus forming a hard crust through which it cannot pass except by causing a serious fracture, then we are laying the foundation for future troubles which will appear either as soon as the kiln is opened or later on after the bricks are laid.

A dense brick subjected to heavy pressure is harder to dry safely than a brick which is made by a process not requiring this pressure. Whether the moisture is being taken from the brick in dryers or kilns, the principal thing is to establish a circulation and have it continuously and gradually increasing until the moisture is entirely gone. For drying in the kiln, brick carefully set, not too close, about thre above two, and after the kiln is filled and closed up, the dampers should be opened full, if it is a down-draft kiln that is being operated. If an up-draft kiln, the platting must be well opened and a gentle fire started where much moisture exists. I do not wish to be misunderstood. The same system of starting kilns is not used for all classes of brick or ware, but we must take into consideration the amount of moisture the ware in our kilns contains, and start our fires accordingly, wood being used for starting all kilns and also for drying all periodical kilns.

The reason a gentle fire is started where much moisture exists is that no more steam may be started than the flues and stacks will carry off, and this will not be very much until the whole charge (as well as the flues) is warmed up and circulation started. The effect of a hard fire in green brick or ware of any kind is to create more steam than can be carried off by the flues and stacks, and this steam, carrying quantities of the combined lime, is deposited on the ware beyond the point at which it was started, with the result that whitewashed brick is obtained. This is not all either, for if the brick were carefully examined from which the steam was so suddenly driven by the fire, a crust would be noticed on the outside, where the brick are not cracked. This prevents much of the lime and salts from being carried off in the drying and it is reserved for future trouble, possibly after the goods have been given some prominent place in the buildings, when after every rain they are brought to our notice, more particularly as the rain helps to carry out little by little what the moisture would have largely carried off if properly treated either in the dryer or kiln.

In conclusion, if the drying of our products is carefully attended to, whether done before coming to the kiln or after reaching the kiln—care being taken to provide a factor of safety in the construction of our dryers and kilns, so that the steam, in place of being driven into and carrying the impurities which it should carry off, is carried as quickly as possible beyond the reach of doing damage and discharged into the outside atmosphere—a great part of the trouble with scum will be eliminated. Good common sense is a very necessary thing for any man to have all through the burning and drying of a kiln of bricks, especially up to the time the kiln is under full fire.

New Branch of Society of Civil Engineers.

A branch of the Canadian Society of Civil Engineers was formed at Ottawa last week by the members of the society resident in that city. A large attendance responded to the call for the purpose of inaugurating this branch, and an interesting discussion was held on the necessary measures to be adopted. The object of the branch was discussed and some interesting remarks made by Mr Butler, Deputy Minister and Chief Engineer of Railways and Canals; Mr. Collingwood Schreiber, consulting engineer to the Government; Mr. Dion, electrical engineer of the Ottawa companies; Mr. Mountain, chief engineer of the Government Railway Commission; Col. Anderson, chief engineer of the Marine Department, and Mr. Coutlee, district engineer of the Georgian Bay Canal Commission. Mr. Chas. R. Coutlee was elected president for the ensuing year.

The Canadian National Association of Builders will hold its annual convention in Ottawa early next month. There will be delegates from many of the most important Canadian centres and the two days' meetings will be chiefly occupied with the discussions of modern buildings in the different places and comparisons of rates of buying, etc. The convention was held last year in Montreal.

At a recent meeting of the council of the Royal Institute of British Architects, held in the rooms of the institute in London, England, it was resolved unanimously that the request of the Architectural Institute of Canada to become an allied society of the Royal Institute be approved and that the necessary arrangements be made.

The 23rd annual meeting of the Canadian Society of Civil Engineers will be held at the King Edward Hotel, Toronto, on Thursday, Friday and Saturday, Jan, 28, 29 and 30. The members will be received on Thursday by His Honor, the Lieutenant-Governor of Ontario.

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Contract Record

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Vol. 23 Toronto, January 27, 1909 No. 4

Municipalities Should Buy Cement Now.

It is a long time since conditions have been so favorable for municipalities and other large users of cement as they now are on account of the low prices for which it can be obtained. Those which have work under contemplation necessitating the use of large quantities of cement could save a great deal by buying at present prices. Cement can be obtained to-day in wholesale lots at $1.30 and in retail lots at $1.60, whereas the retail price before the recent decline was from $1.90 to $2. These low prices are the result of conditions which have prevailed in the business world generally throughout the season of 1908. The decline was also brought about partly by the competition of large United States firms which have established branch factories in Canada. Owing to the business depression which was in force for some time this competition was very keen and prices naturally declined. The indications are that this state of affairs will not continue much longer. Some large corporations foreseeing this have already gone into the market with their requirements. The railroads are reported to have ordered large quantities for their 1909 operations. It is reported also that the supply in the West is already low. Two or three of the factories in Ontario are not manufacturing at all on account of the low prices. With an improvement in the demand and a lessening of stocks it is natural to expect that prices will advance before long. This might not occur until the middle of next summer, but it is among those things which are extremely probable and is already being figured upon by the manufacturers and by careful buyers.

Municipalities therefore, which have much work under consideration, such as the laying of sidewalks and roadways and the erection of concrete bridges will do well to look into the present state of the market and make sure of obtaining whatever they need in the cement line before the prices advance. Once they have commenced to advance it will probably be a long time before the present advantageous prices can again be obtained. Manufacturers are willing to accept orders at the present prices, for delivery any time during 1909, and there is no reason therefore why contracts for supplies should not be made at once. The same state of affairs applies in a large extent to nearly all the ordinary structural materials. Prices at present are unusually low. The cost of labor is also low, comparatively speaking, and all conditions point towards the wisdom of carrying out contemplated works as soon as possible.

Canada's Need of Technical Schools.

A subject which is rightly interesting many of those most closely identified with the development of the Dominion is that of technical education, and it is a matter that will appeal directly to every thinking man throughout the country. There are those who would quash any suggestion for the inauguration of a campaign for the establishment of technical institutions—people old fashioned enough to adduce the antiquated argument that what sufficed for them should suffice for posterity. These people overlook an old truth, namely, that nothing stands still, no condition is permanent; there is but one alternative to progression and that is retrogression. Happily, however, the general trend of public opinion in Canada is towards improvement. That which was accomplished yesterday is but the incentive for greater effort to-day and to-morrow. In a land so peculiarly favored as Canada it would be a national slur if this were otherwise.

It is not pleasant to have to admit that in many ways there is not the same thoroughness in the learning of trades and crafts as formerly. There was a time when no mechanic was deemed worthy of the name until he had served several years as an apprentice and perhaps given additional time as an improver. Now he goes to work when he has barely mastered the rudiments of his trade and when he has acquired but a superficial knowledge of his tools. In most cases there is no alternative left open to him. He moves in a sphere where the earning power of the young is a negotiable factor in the upkeep of the family, and he sallies forth into the world, unaided, to make his way as well as he can.

Some trite observations in this connection were recently made by Professor Sexton, of Halifax, Director of the Department of Technical Education in Nova Scotia, who pointed out the fact that our present system of public schools, high schools and universities benefited only the minority of Canadian children. "If," he said, "men are to attain to the best that is in them they must be removed from conditions of squalor or want, and so they must work, and for that should get a remuneration for their productiveness that would allow them to live properly. It is assumed that every member of society has his vocation or contributes his share in productive activities. It is a necessary corollary to that, that every worker should have such facilities given him as would enable him to become a high-class producer. The State owes it to the individual that every worker should have the chance to train himself for his life occupation. To-day every facility is given for the training of professional men. You will find that only four per cent. of our children go into the professions."

The rising generation of Canada to-day show an innate tendency toward creativeness and self-development and in face of this tendency it would be a mistake on the part of the legislators to ignore the problem of establishing technical schools. No better example of the necessity of such institutions can be afforded than Nova Scotia. It has been computed that from this province alone no less a sum than $70,000 is sent annually to correspondence schools in the United States.

The situation is summed up by Professor Sexton in the following terms:

"To-day the Dominion of Canada is a world spectacle in its development. No people have ever had the chance to build a nation in the light of a thousand years of civilization's experience as we have. It is right that Canada should choose what has been proven good and adapt it for herself. Germany has proven technical education. It has given her industrial pre-eminence even though she lacks natural resources. What could not Canada do, which has such great wealth? It little behooves her to wait any longer. Canadians are anxious for the new system. When it comes it will be the salvation of the country industrially. Technical education is the greatest problem before Canada to-day. It is greater than the problems of railways and canals, public ownership and clean politics."

Canadians at the Cleveland Cement Convention.

A merry party of Canadians went to Cleveland, O., and spent a couple of days at the annual convention and cement show of the National Association of Cement Users. The delegation from this side of the border went on behalf of the Canadian Cement and Concrete Association with a view to gathering information which would be valuable to the coming Canadian convention and exhibition. The main section of the party left Toronto on Tuesday night in a special car, and were headed by Mr. Peter Gillespie, of the School of Practical Science, the president of the association. Mr. Gillespie has been indefatigable in his work on behalf of the association, a large measure of its success being due to his efforts. The visitors arrived in Cleveland on Wednesday night and were back in Toronto early on Friday, having spent every minute of the time profitably and pleasantly.

Among those who accompanied the party or went direct from their own homes were: Mr. Kennedy Stinson, of the Stinson-Reeb Co., Montreal; V. Perry, chief inspector of the eastern division of the National Transcontinental Railway; Harold M. Davey, of Ottawa, engineer, connected with the Public Works Department; Purvis Richie, of Quebec; C. H. Thompson, manager of the Canadian Art Stone Company, Toronto; P. H. Youman, of the same company; Douglas C. Raymond, of the Concrete Engineering & Construction Company, Toronto; Gustave Kahn, of Toronto, manager of the Trussed Concrete Steel Company; R. M. Jaffray, manager of the coming cement show; A. J. Cramer, Brantford, Ont.; T. Martin, of the Martin Pump & Machine Company, of Toronto; F. W. Scherbarth, of the "Contract Record"; I. McDonald, of "Construction"; M. F. Wilson, of Toronto; Mr. Pulfer, of the Ideal Concrete Machinery Company, London; Mr. E. Martin, London; Mr. Caniff, of the Expanded Metal Company, Toronto; Messrs. Cadwell, Gray and Nixon; Mr. W. T. Wettlaufer, of Wettlaufer Bros., Mitchell and Stratford, also visited the show and convention. His father, Mr. Geo. Wettlaufer, of Buffalo, had an exhibit of cement brick machines. American firms are constantly coming over the border and opening branches in Canada. The Wettlaufer firm have reversed this, their business having originated in Canada and being now pushed in the Republic as well. Mr. Wettlaufer Sr., is in charge of the United States business, with headquarters at Buffalo.

Master Painters' Annual Meeting

The annual meeting of the Toronto Association of Master House Painters and Decorators was held recently in the Temple Building. President Phinnemore occupied the chair, and there was a large representation of the members present. The treasurer's report showed a balance on hand in the bank. The election of officers resulted as follows:

President, E. J. Linington; 1st Vice-president, Jas. Kitchener; 2nd Vice-president, J. B. Thomson; Secretary-Treasurer, Stewart N. Hughes; Executive Committee, G. Cantwell, A. Phillips, J. R. Robinson, Chas Reeve and Chas. Landon; Delegates to International Convention, Messrs. Linington, McCausland, Faircloth, O'Hearn, Phinnemore, Johnston and Peacock; alternates, Messrs. London, Reeve, Robinson, Cheshire, Stewart, Phillips and Chrysler. After the business session a pleasant evening was spent in progressive euchre, the prize winners being Messrs. McCausland and Cheshire. The evening was enlivened with songs by Messrs. Pigott, Cantwell, Woods and Hulme.

Mr. E. J. Linington, the New President of the Toronto Association of Master House Painters and Decorators.

Saskatchewan Leads West in Railway Construction.

In the matter of railway construction Saskatchewan leads the West, as is shown by the record of the new mileage laid during the year by the Canadian Pacific in the four western provinces. The total mileage of new track laid by the C.P.R. during 1908 in Manitoba, Saskatchewan, Alberta and British Columbia was 289.3 miles, 271.3 of which were in Saskatchewan. In mileage under construction at the present time Saskatchewan also leads the way with a total more than equal to that of the other three provinces combined, the exact figures being: Saskatchewan, 171.7 miles; Manitoba, Alberta and British Columbia, 159.70 miles.

Annual Reports of the Builders' Exchanges

Increased Interest Manifested—Excellent Financial Conditions—Optimism Prevalent.

Excellent Status of Toronto Exchange.

The annual meeting of the Toronto Builders' Exchange was held on January 18th in their assembly room, Richmond street east. There was a large and representative attendance of the members and the proceedings were of much interest. The balance sheet and auditors' report were presented and showed the exchange to be upon a sound financial basis. During the year the membership has been considerably increased, and a live interest is evinced by the members in the welfare and advancement of the exchange. The reading of the directors' report brought forward many points of special importance, and was followed by some interesting discussion.

Mr. Arthur Dinnis, The New President of the Toronto Builders' Exchange.

The following were elected as a Board of Directors for 1909:—

President, Mr. A. Dinnis; 1st Vice-president, Mr. George Gander; 2nd Vice-president, Mr. Chas. Bulley; Treasurer, Mr. Jas. Crang; Directors, Mr. Robt. Page, Mr. H. Jennings, Mr. O. M. Moore, Mr. Jno. Chalkley, Mr. Jno. Aldridge. The auditors for 1908, Messrs. J. B. Thomson and Walter Davidson, were reappointed for 1909.

Bright Outlook at Montreal.

The eleventh annual report was presented recently at the meeting of the Montreal Builders' Exchange. The following extracts show that while the past year was not as favorable to the building trades as some of its predecessors the directors feel that prospects for this year are of a bright nature. Among other things the report states:

It is a matter of regret that your directors, in their present annual message to the Builders' Association, cannot submit as favorable a report concerning the building trades during 1908 as it was their privilege to do in the years preceding. As mentioned in the annual report at the close of 1907, there were then already ominous indications of a widespread crisis on this continent, the causes of which were carefully reviewed. Extravagance, whether personal or national; over-production, and inflated values can only have one result—that of final collapse, and readjustment of commodities (comprising both labor and and material) upon a sane and normal basis. The financial stringency, although not so acute in our Dominion as in the States, was far-reaching and slower in developing; hence the recovery has proceeded more gradually than anticipated.

So much for the past. For the present year a spirit of optimism has a right to prevail, and your directors feel justified in a message of hope for a larger and more promising outlook for 1909. The resources of the country are not impaired, and the land itself is the final producer of wealth. The value of the recent crop is estimated at $500,000,000, and we are annually producing greater mineral wealth in our own borders which cannot fail to stimulate building construction, both commercial and domestic.

Your directors again wish to go on record that they are more than ever convinced that the great majority of the work-people of this country, union and non-union, are honest, fair-minded, well-meaning people, striving to do what is right and fair; and that the great difficulty arises not with themselves but with the irresponsible leaders who misrepresent, distort and falsify things to suit their own ends, regardless of the welfare of the people they represent.

In the aspiration after higher things, and believing it to be for the greatest benefit to our increasing membership, your directors decided to secure a whole flat in the new Eastern Townships Bank Building, on St. James and Victoria Square. It is the finest and best situated modern office building, being central and accessible by all car lines. It is undoubtedly incurring a great responsibility, but the board has every confidence in you, as members of an important association, growing yearly of greater value to you, to support us by your daily presence at "change-hour" and to take a personal interest in building up our membership by bringing in your friends. It is proposed to establish a permanent exposition of building materials therein, and we bespeak your hearty cooperation by exhibiting any materials you handle or manufacture, so that architects and clients may benefit by having under one roof all that goes to make a modern building.

The following officers were elected for the ensuing year, 1909:

President, Jos. N. Arcand; Vice-president, J. W. Hughes; Directors, James Ballantyne, representing master plumbers; Alex. Bremner, representing builders' supplies; T. Charpentier, representing carpenters; Donald Church, representing reinforced concrete; Jos. Brunet, representing granite and marble; S. H. Parsons, representing electrical contractors; Wm. Rutherford, representing lumber; T. A. Morrison, representing builders' supplies; W. T. Castle, representing painters and decorators; John Quinlan and A. F. Byers, general contractors. A vote of thanks was passed in favor of the retiring president, Mr. Thos. Forde, the directors, and the secretary, Mr. J. H. Lauer.

Kilns Suitable for Manufacturing High-Grade Brick

The Pros and Cons Reviewed—Practical Suggestions by a Practical Man.

At the recent convention of the Manufacturers of Clay Products, at Brantford, Ont., an account of which was published in our last issue, an interesting paper, entitled "Kilns Suitable for the Manufacture of High-Grade Brick," was read by Mr. J. W. Ball, superintendent of the Toronto Fire Brick Company, Mimico, Ont., whose remarks were as follows:

There are many kinds of kilns on the market to-day for the burning of clayware, viz., up-draft, down-draft, muffle, continuous, semi-continuous, etc. These kilns take various shapes, round, square, rectangular, etc., and all are being used to-day with more or less success. To burn a high grade of brick successfully in shape color and soundness, it has to be subjected to certain conditions, and the kiln that can produce these conditions most effectively is the kiln most suitable for the manufacture of high grade bricks.

What are the necessary conditions to bring about this desired state of things? The first stage of burning is the removal of the water that is contained in the pores of the clay even after drying. This stage is one that has an important bearing on the final result. In this operation may be produced damage to the brick that no subsequent operation can remedy, and that may lessen or totally destroy their market value. If during this period the fires are pushed to any great extent it will cause the brick to suddenly expand and forever spoil their density. To have poor circulation (which means insufficient draft, moreover, slow evaporation) is one way to produce scum on the bricks. It is therefore necessary during this stage to generate heat slowly, yet constantly, with a good draft and plenty of air, and under no consideration should the temperature be raised above boiling point for the first two or three days. After the water-smoking has been carried through successfully and the kiln is dry, the heat can be slowly and evenly raised with plenty of air passing into the fireboxes to drive the heat through the entire mass of brick. It is during this stage that all combustible matter is taken out of the brick. A kiln of brick pushed at this stage of burning is likely to be spoiled, but this stage of burning can be very quickly done, providing that good draft is maintained, plenty of air is allowed to pass into the fireboxes, and the firing is done lightly and frequently. Bricks damaged at this stage are likely to show a swelled appearance. Sometimes when they are broken you will find them blue and black through the section and very spongy. I have seen brick spoiled at this stage twice their normal size when drawn.

Perhaps you have noticed pieces of brick that show a very porous blue and swelled appearance. This trouble is caused by improper treament during the oxidation period. The outside crust of the brick has been fused with quick-firing and closed up the pores so that the combustible material has had no way of escape and has therefore burst, become swelled or discolored in consequence. This stage of burning can be watched and its progress noted by taking bricks out at intervals and breaking them through. At first you will notice a black centre with a greyish border and as the black centre decreases the light border increases. When the black has disappeared altogether and the whole mass has reached a greyish color, the oxidation period is practically over. The vitrification, or hardening process, comes next, when the clay is bonded together and when it attains its maximum density, strength and resistance to abrasion, and absorption of water. This is the shrinkage period, and it is our aim to get the greatest amount of shrinkage without deforming the bricks or causing them to stick together.

There are many more points of importance than those mentioned to produce a high grade brick. At no time should there be any great change of temperature, but an even and gradual rise of heat always, and the whole mass of brick should be controlled by the dampers. After the bricks are burnt, carefulness should be exercised in cooling, to produce a sound and properly annealed brick, and it ought to take as long to cool a brick as to burn it up.

Now as to the kilns. There are many kinds of kilns on the market to-day, all being used with more or less success, but though there are many kinds of kilns there are also many more kinds of materials, therefore the kiln suitable for any particular clay is a matter to be decided by the man on the spot. However, I think it will not be amiss if I give a few of the advantages and disadvantages of the various kinds of kilns used to-day. The advantages of an up-draft are: (a) Its large capacity at moderate cost of construction; (b) its quickness in cooling; (c) its convenience in emptying; (d) its low cost of repair, etc. Its disadvantages are the practical impossibility of burning without considerable waste from cracked, broken, warped and overburnt bricks, also the time and expense in platting and covering down each time a kiln is burnt. Nevertheless, this kind of kiln has a great advantage over the stove kiln both in quality and quantity. The advantages of a continuous kiln are: (a) Saving of from 50 to 60 per cent. of fuel; (b) larger percentages of hard brick than in the up-draft kiln; (c) can be operated in all weathers. Its disadvantages are: (a) Large investment in construction before any results are obtained; (b) the unhealthy conditions to which the men are subjected during drawing and setting hot chambers; (c) must be operated continuously to obtain full benefit in fuel economy. The advantages of a semi-continuous kiln are that it can be built to any capacity and is more economical in setting and drawing, as the brick can be set on one side and drawn on the other. Conveyors can be used if necessary for both setting and drawing.

The two last named kilns are used generally for common brick, but in many places a really good face brick is produced. Of course, this kind of kiln with a flashing or bag wall, so that the fuel can be kept out from amongst the brick, will greatly add to its value as a face brick burner, but where cheapness of production is the prevailing feature these kilns have a great advantage over any other kiln being used to-day. With regard to the muffle kiln. This is used in connection with glazed brick, terra cotta, etc. I have known a few places where it is used for face brick purposes, but its smallness of capacity and the cost of heating through the inner lining makes it too costly to be of any use for face brick purposes.

This brings us to the round down-draft kiln. This kind of kiln is very extensively used by the sewer pipe makers and also a large number of brickmakers, and is. I believe, a general favorite. This kiln is no doubt the best for small works and will produce quality equal to that of any kiln on the market. Its advantages are: (a) Small cost of construction; (b) durability; (c) less expensive for repairs; (d) more uniformity of heat passing through the bricks. For salt glazing and flashing purposes it cannot be beaten. A great disadvantage to this kiln is its utilization of space on the works in disproportion to its capacity.

There are two kinds of this kiln being used to-day. One with the centre stack and one with the stack outside. The kiln with the centre stack has an advantage over the one with the outside stack. You can burn quicker because the stack is sooner heated up, hence a quicker draft from practically the first start of burning, also the heat that has passed through the bricks has to return via the centre and this affords the centre a better chance of heating up, but this kind of kiln is a little lower in capacity than the one with the stack outside. Yet, if everything is taken into consideration, with its cheapness of construction, the speed in burning, etc., the room the stack takes up is more than compensated, the flue arrangements more than cut in two, and the stack need not be more than 4½ inches thick.

I was formerly head burner on a sewer pipe and brick plant with 24 kilns, and 15 of these had 4½-inch stacks in the centre, and we could burn anything from three to ten hours quicker than the ones with the stacks outside. Now we come to the ractangular down-draft kiln. This kiln has more relations than any other kiln on the market. It is constructed in many different ways. Its disadvantages are: (a) Its high cost of operation, bracing being especially expensive; (b) high cost of repairs; (c) it does not permit of quite so uniform a distribution of heat as the round kiln, but it can be built to a large capacity and utilizes the yard space to the very best advantage.

There are a few features in the down-draft kiln I would like to mention. The first thing of importance is the draft. We hear a great deal of talk of draft to-day. A down-draft kiln should have plenty of draft. There is a saying that you can always take a little bit off when you cannot put a little bit on. The draft of a kiln has two purposes, one for the generating of heat and the distribution of the same all through the bricks. The other is to draw away moisture or any harmful gases given off by the bricks. Another feature is that the flueing should be so arranged that the draft is equally divided so that the heat generated in the fire boxes shall pass through the bricks evenly, ensuring an even burn.

The two kinds of kiln principally used in this country are up-drafts and down-drafts, therefore, perhaps it would be as well if we compared the two kilns and judged them on their merits to produce a high grade of facing brick and see which of the two kilns is the most suitable for our purpose.

Personally, my inclinations lean very strongly towards the down-draft kiln, although I have no doubt many favor the up-draft kiln. Why do I favor the down-draft kiln? (a) Because it can be heated more evenly and a more steady heat is passing through the whole of the kiln; (b) because it is at all times under control; (c) because there is less volume of cold air passing into the kiln through the fire boxes during firing, and what cold air does pass in comes in contact with that hot zone between lining and bag, and by the time it reaches the bricks it is practically hot, therefore the bricks are not subjected to that sudden change of temperature as in an up-draft kiln. The bricks are consequently stronger and sounder, and not so brittle, also a down-draft is more easily handled during the vitrification or hardening period; (d) because the top of the kiln is subjected to the intense heat instead of the bottom, as in an up-draft; (e) because it is possible to get an even colored brick from top to bottom and from sides to centre; (f) because the hot gases in a down-draft kiln can be handled more effectively than in an up-draft.

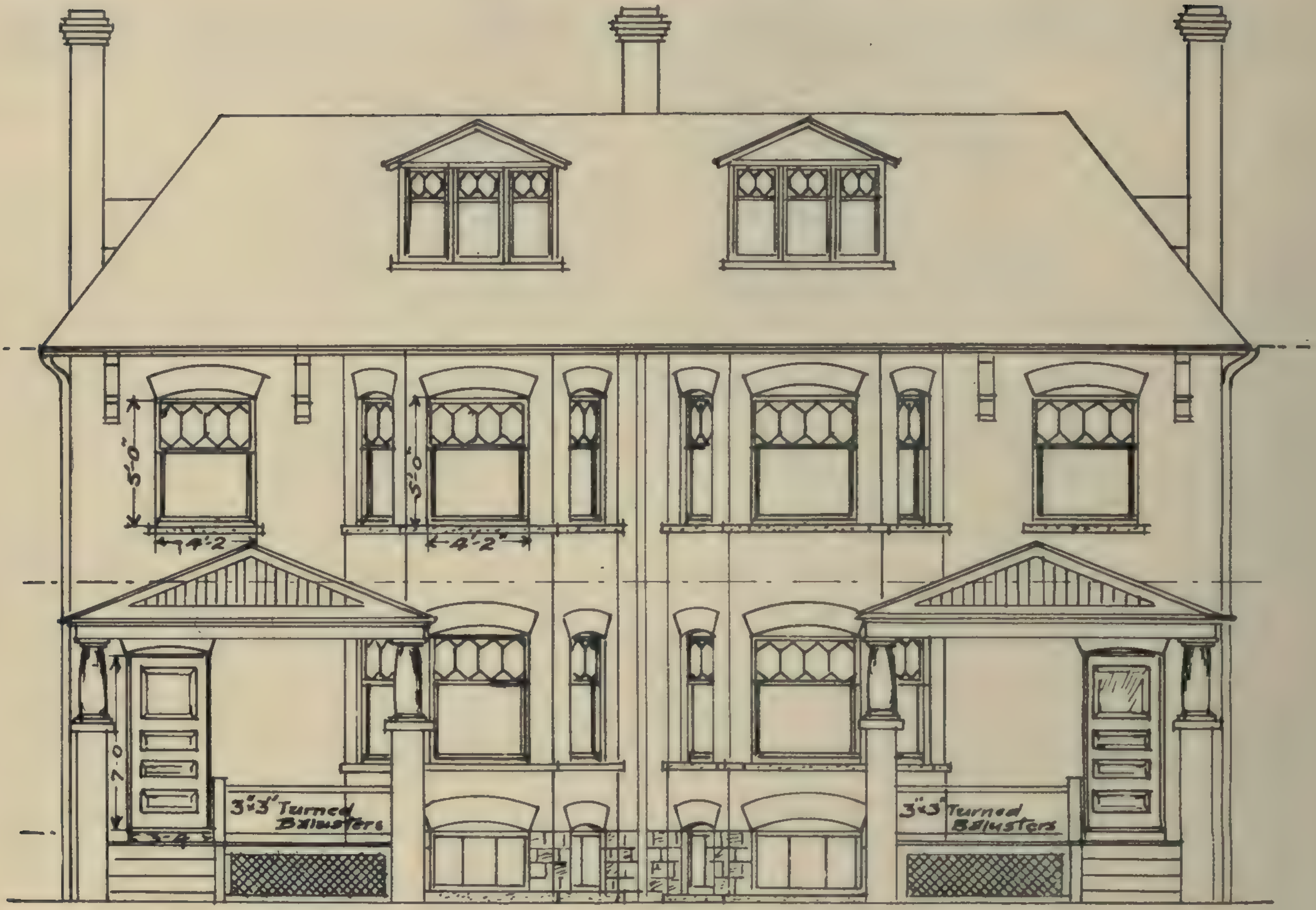
During the finishing stages the draft can be regulated so that the gases pass more slowly through the entire mass, hence a saving in fuel. This can be done to a certain extent in an up-draft kiln, but not so efficiently, because in an up-draft it is somewhat difficult to find out exactly where the draft is strongest and when you cover down it simply goes somewhere else. This perhaps is a good feature in an up-draft kiln, but you cannot regulate the entire mass so that it affects the whole, whereas with a down-draft kiln the whole of the draft is confined to one channel or more and with the dampers you can gradually close it until the entire kiln is stopped. Therefore you have at all times perfect control of the fires, the regulating of the draft, and the distribution of the heat to any part of the kiln without any unnecessary labor or cost. This work is quick, simple and effectual, while in the up-draft it is much slower, the cost is greater, and it is a source of trouble to burners. When burning is finished in the up-draft kiln, by the manipulation of the dampers it is an easy matter, if necessary, to raise the heat a few degrees and to hold it so that the bricks can get well annealed before cooling. This in an up-draft kiln is practically impossible, for as soon as you have finished burning your bricks begin to cool, and this sometimes is a very serious matter in the manufacture of a high grade brick. I do not intend to suggest whose kiln is the best for this kind of work, but what I do say is that where quality is the prevailing feature in a concern the down-draft is the ideal kiln.

Useful Publication Issued by Government.

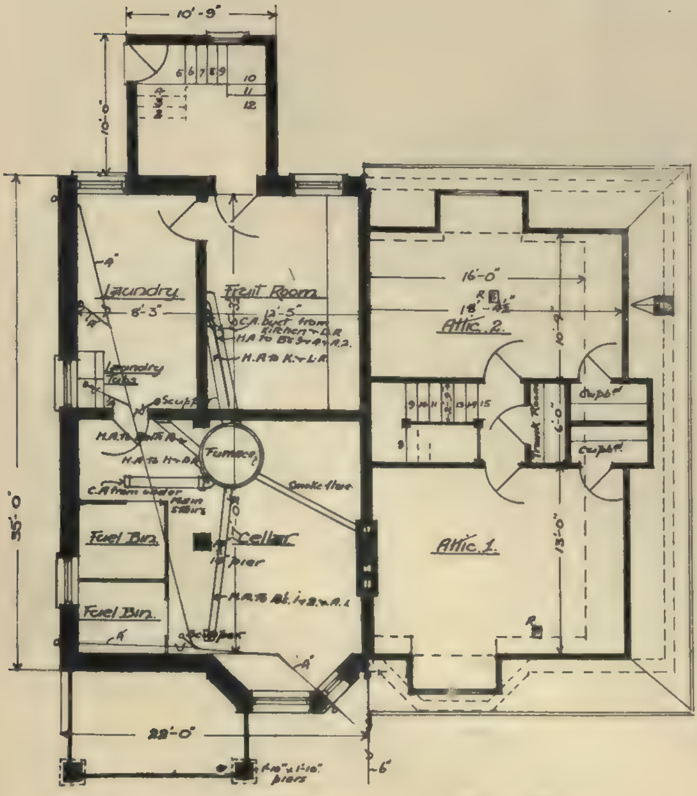
The Department of Mines of the Dominion Government, under the charge of Mr. Eugene Haanel, Ph.D., Director, has issued an important, voluminous and complete report of the mining and metallurgical industries of Canada. The work comprises 936 pages of text descriptive of all the metallurgical and non-metallurgical mineral mines and metallurgical and clay industries in the Dominion and is illustrated by some 444 engravings, drawings and maps. It includes a brief historical sketch of all the provinces and an industrial review with a description of the magnitude, equipment and mode of operation of every important mine and plant, together with the capital and personnel of each organization or company. The book will be especially interesting to readers of the "Contract Record" because of the fact that it has a large department devoted to the structural materials of Canada in which the resources of each province are described in detail and also the companies which are engaged in manufacturing structural materials. In order that the book shall fall only into the hands of those for whom it is intended the department has decided to charge $1 for it.

Darling Brothers, Montreal, Que., manufacturers of steam specialties, have issued a concise little catalogue containing illustrations of some of their leading lines. During recent years this firm has been successful in furnishing steam specialties and heating apparatus for some of the largest factories and public buildings in Canada.

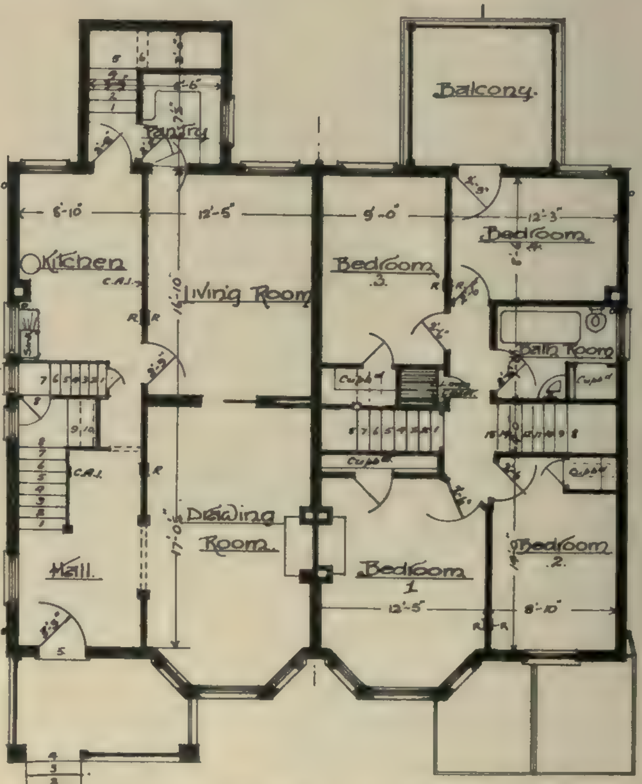
Mr. Arthur A. Denison has been engaged by the city of Toronto as expert adviser in connection with the case of E. J. Lennox v. the City of Toronto.



Front Elevation.



Basement Plan — Attic Plan



Ground Plan — Chamber Plan

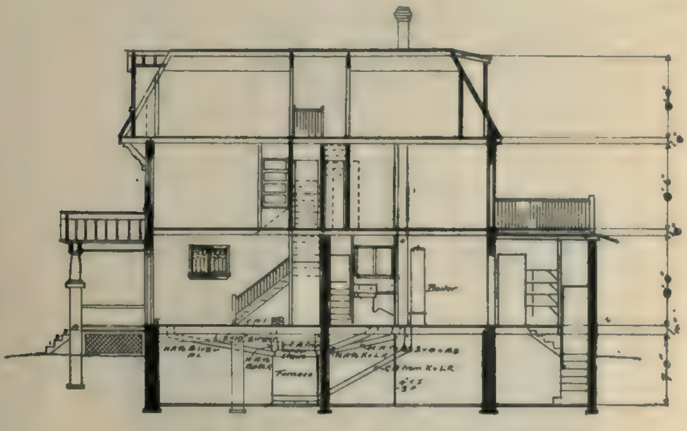
An Attractive Pair of Semi-Detached Dwellings

Practical Illustration of the Fulfilment of Average Requirements at Moderate Cost.

An example of pleasing exterior, utmost utility and moderate cost is afforded by the pair of semi-detached residences illustrated herewith, which were designed and erected recently by Mr. H. Bryan Gilbert, architect, 7 Standard Exchange Building, Toronto. The attention of the architect was particularly drawn to the fact that the sum of $6,000, exclusive of land, was not to be exceeded.

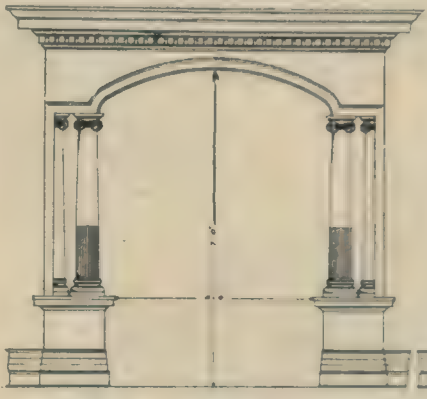
A glance at the plans will show that the square plan has been adopted, with no expensive features in the brickwork. The main walls have been built of brick, with Roman stone window sills, the external walling to cellars being constructed of stone, in rubble courses. Accommodation is provided in the cellar for the furnace, with two fuel bins, one for furnace and one for kitchen fuel. In the rear of the cellar a laundry and fruit room have been provided. The ground floor plan has been designed with a square hall, 12 feet 6 inches by 8 feet 6 inches. The drawing-room, which is 12 feet by 17 feet, exclusive of the bay, is connected with the hall by an archway with pedestals, columns and pilasters in the Ionic style, constructed in pine and stained a dark walnut, wax polished. The main stairs have been built in birch and the whole woodwork of the hall stained dark walnut and wax polished. Brass hardware and leaded lights have been fitted to the doors, affording a rich appearance.

The illustration of the doors in the living room suggests a treatment by which a very pleasing and rich appearance is secured at an inconsiderable additional cost. The kitchen is 16 feet 6 inches by 8 feet 6 inches, and is placed on the same side of the house as the hall. This arrangement does away with the necessity of a cross passage, and has the additional advantage of shutting out a view of the culinary operations.

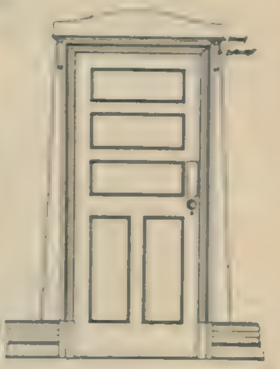


—Section—

On the chamber plan, four good-sized bedrooms have been provided, with suitable cupboard accommodation in three of the rooms, also a linen closet and bathroom. The bathroom has the usual fixtures with nickel plated fittings. Two large attics with cupboards and a trunk room have been provided. The front attic is 18 feet by 13 feet, and the back attic 10 feet by 18 feet. If desired fireplaces can be built in these attics and a roof light arranged for. This plan if carried out would give a splendid billiard room. The sloping portion of the roof, and also the roof to the verandah, has been covered with slate, and the flat parts with felt and gravel. A separate warm air furnace has ben installed in each house and double side wall registers have been used. The cost of the heating arrangements can be carried out at an approximate cost of $90 per house. Each house has been piped for gas, and wired for electric light to all the rooms. Hot and cold water pipes have also been laid to all plumbers' fixtures.



—Sketch of Arch between Hall & Living Room—



—Elevation of Door to Dining Room—

The houses should be erected according to the illustrations for about $5,500 complete, exclusive of land, and readily rent for $30 per month, which would give the investor a gross return of approximately 10 per cent. on the capital invested. The percentage of the return of the money invested depends, of course, upon the finish of the houses and the locality in which they are erected, but for the usual finish given to houses of this class the return should not be less than that stated. The bricklayers' and masons' work should not exceed $1,200 and the carpentry $2,150. The latter figure would, of course, depend greatly upon the internal finishings.

The New English Patent Law.

The first revocation of a patent granted to a foreigner by Great Britain under the new Patents Act is announced. The case involved two patents granted to a German upon the same invention, a process of manufacturing thin imitation stone slabs or tiles. An exclusive license in this country was held by a Belgian company. It was admitted that the process had been carried on extensively outside of the United Kingdom, but in defence it was stated that the company's factory in Belgium was sufficient to deal with the whole of its trade in this country and elsewhere, and that the articles could not be produced as cheaply in Great Britain as abroad, owing to the higher cost of labor and materials. It was also stated that the company had advertised in British trade journals that the owners were willing to dispose of the patents or to enter into a working arrangement with firms in Great Britain likely to be interested in the process, and had communicated with various British firms for the purpose of granting licenses under the patents or of selling the latter, but that no offer had been received in response.

Reinforced Concrete for Architectural Construction

A Discussion of Its History and Principles by Walter J. Francis, C. E., Continued from Last Issue.

The sand used plays a more important part than is generally supposed. There are sands which look all right, but which will not make strong mortar. The sand should be siliceous, not necessarily sharp, but well graded as to the size of the particles, and comparatively clean. As an instance of the extreme case of absolutely "sharp" sand with evenly sized grains we have the "standard sand" of the laboratory which is a finely crushed and screened quartz; and it will not make a mortar approaching in strength or density that made by pit sand.

The stone where fire-proofing is a consideration should be trap, if it can be obtained. The grading of the particles is also of great importance. For example, the resultant concrete will be much stronger and denser if made with a stone varying from ⅛-inch to 1-inch than if made with pieces uniformly ¾-inch.

Speaking generally, the strongest, cheapest and densest concretes result from a mixture graded as to size, all the way from the cement particles to the coarsest bits of the broken stone. On every job this should be determined by actually making and breaking specimens of concrete and by any of the standard methods of ascertaining the voids in the sand and stone.

Gravel may in some cases be used advantageously to replace stone. The resulting concrete is entirely satisfactory, and some pits exist where little or no correction is required to allow the use of pit run. The voids, however, must be carefully determined and checked from time to time.

The steel must be kept clean and absolutely free from oil or grease of every kind.

All the moulds should be kept clean, carefully aligned and braced. They should be thoroughly cleaned of all chips, rubbish and dirt before the steel is placed. In columns a small hand hole for cleaning purposes ought to be made in the moulds just above each floor level.

The steel itself should be fabricated in units before being placed into the moulds and be so supported by rigid means that it will not be displaced during the pouring and manipulation of the concrete. If the steel of any individual member be not rigidly fastened together by wires then the rods themselves should be held in place by small rounds or flats bent to the required shape to hang the members from the moulds. The effect of misplacement is readily seen when it is remembered that if the rods get too low in a beam, say, they are not protected from fire and will probably not be sufficiently encased in concrete to take their proper stresses, while if they are too high they are not so well able to care for the bending moment and will consequently be stressed to a higher limit than the designer intended.

It is quite unnecessary to remark that such glaring errors as the substitution of reinforcement must be carefully guarded against—an error which has occurred through carelessness or in substituting something "just as good" where the intended pieces have been lost.

The mixing or actual making of the concrete is important. It is a well known fact that a rich mixture may result in a poor concrete through insufficient turning. On the other hand a leaner mix may make an excellent concrete if turned sufficiently. For this reason the writer in every case uses a batch mixer, and of the batch mixers he prefers a type from which a small quantity at a time may be conveniently drawn if desired. This brings up the question of the necessity of thoroughly stirring up a batch that may be standing for a few minutes in a hopper or barrow before drawing off a quantity or depositing it. Unless this be done where the broken stone is very heavy, it will be found to have settled to the bottom and the first part of the effluent will be coarse and stoney, leaving the mortar to follow by itself.

Sufficient water should be used to make a wet mixture. Dry concrete cannot be successfully used because it will not adhere to the steel without a great amount of ramming, and ramming is in most cases absolutely impossible. Water makes one of the best pounders and it insures the adhesion required, but it is not advisable to make the concrete too wet. There is a certain state of wetness which gives the best results and the best descriptive terms the writer can think of are "stickiness" and "toughness," attributes of mortar that cement finishers are very careful to watch and which can be only obtained by experience. It is better to have the mix too wet than too dry. Immediately on depositing, the concrete should be thoroughly manipulated or puddled. For

Concrete Water Tower—Showing Possibilities of Exterior Designing.

columns this can be done readily with rods or gas pipes. In beams and plain walls a set of prongs formed out of thin steel plate, much like a potato fork with wide prongs, can be used to work back the stone from the wall faces and release the bubbles of air and water which otherwise would form pitted surfaces.

Where very wet mixtures are used with some cements a coating of slimy, inert material called "laitance" may be found on the top of the concrete a few hours after it has been in place. This should be carefully scraped off the surface before renewing operations.

In pouring floors care should be exercised to see that the slab work is done continuously with the beams to ensure monolithic action. After concrete has set it is difficult to make a perfect bond. This, however, is entirely obviated if the first concrete has not set up and the formulæ of the mix of the two is not very dissimilar. In stopping overnight, it is now generally agreed that the proper place to make the joint is by a bulkhead at the point of no shear, which is generally the centre of the floor beams and slabs. This line is best jogged somewhat, and on resuming if the surface be broken down a little and swabbed with a 1 : 1 mortar a better joint will result.

In order to permit the concrete to attain its maximum strength it must be given all the water necessary to complete the chemical action of the cement in crystallization. For this reason for two or three weeks it is well to sprinkle the work at intervals with the hose, to assist the concrete to mature. In very hot weather the work should be covered with canvas, kept damp.

On no account should reinforced concrete work be attempted at temperatures below the freezing point unless it is absolutely necessary. The risk involved is great and the necessary expense renders the operation commercially impracticable. The writer was on one occasion compelled to do some building work with the thermometer at 4 below zero. The work was satisfactory—but, for the sake of your pocket, your bodily comfort and your peace of mind, don't try it. Incidentally he has done very complicated reinforced concrete work with the thermometer 104 in the shade and 140 in the sun. Again he says "don't try it," and the reasons are the same. At all normal temperatures between 40 and 90 the work can be successfully and economically conducted without unusual precautions. The ideal weather for the work is cloudy at a temperature from 45 to 65 degrees.

The question of the removal of formwork requires to be handled with judgment. More time is required to enable the concrete to set up at low temperatures. Ordinarily the forms should remain on the sides of beams and walls ten days, and on the bottom of beams and slabs a week longer. Shores should be left under beams as long as practicable, extending from floor to floor and storey after storey. The removal of forms prematurely is responsible for all the accidents to reinforced concrete buildings that have come to the writer's notice.

Throughout the discussion under the head of construction it would appear that the word "careful" has been used too many times. If the writer were considering a revision he would only add the words, "Be careful." After all, this is the course pursued in every other high grade construction. Care and experience are exercised right along. In a steel superstructure the designs are by a skilful designing architect or engineer. The details are by experienced draftsmen. The drawings are made with great accuracy, and are checked by a high-priced checker. The material passes through the shop in the hands of experienced men, under the eye of the inspector of the bridge company and also of the architect's inspector. Every operation of riveting, facing, cleaning and painting are watched. In the field, the erectors are really experienced mechanics and the field inspector follows the work to completion. Reinforced concrete requires only a corresponding amount of care and good judgment.

By-laws and Specifications.

The extremely wide variations in the limits set by the municipal authorities are very unsatisfactory from a constructor's viewpoint. The art has so far advanced that a common basis of permissable stresses should be adhered to. To obtain this, in Canada, the writer would suggest that your association immediately take in hand the appointment of a representative committee composed of, say, five persons conversant with the practice and limits of reinforced concrete construction for architectural purposes. A very desirable committee would appear to be two architects, one member of the Canadian Society of Civil Engineers and two representing the specialists in the art.

As an instance of the need of some common and rational basis for concrete in compression, the building laws of New York permit 750 pounds per square inch. Toronto permits less than half this amount, namely 350. The writer is aware of specifications demanding as low as 300. The French Government Commission recommended 2-7 to 3-5 of the ultimate strength as determined by tests on 90-day concrete, thus permitting about 900 pounds per square inch.

Doorway of American Tobacco Co.'s Building, Montreal.

This question is a large one and should be settled on a reasonable basis at once. Until it is officially dealt with recommendations are useless. The actual strength of various-sized masses of concrete in compression must be considered, because four square inches loaded in an area of four square inches is an entirely different thing from one hundred inches loaded all over to the same unit of load. Again, the various mixtures must be taken into account, and the strength of the concrete at various ages. At the same time the age at which the building is to be loaded and the possible extent of the maximum live load must also be considered. The results of the most reliable tests must be collected and properly weighed. The records of existing buildings in the detail design of their members and the duties they have performed must also be used. Many of the large American cities, as well as the European cities and countries have studied the question and adopted regulations which appear to be generally satisfactory.

Exteriors and Exterior Finish.

In the present state of the art, and for our climatic conditions, concrete is not recommended for exteriors. With this view most of the exponents of reinforced concrete will agree. This is partly due to the fact that the lines of our present-day buildings are the result of the development of building design in wood, brick and stone. It is incumbent upon the architects themselves to develop a general design to suit the new material. That satisfactory exteriors have been produced in concrete all must admit, but these are altogether too expensive when compared with other types. The telephone building in Shanghai, China, was actually cut by hand over the whole exterior and is essentially a carved monolith. What would happen to such a suggestion at American stonecutters' wages? Architects have always risen to the occasion no matter what the available building material, and it is only a question of time before this problem will be solved.

If, for certain reasons, concrete must be used for exteriors, then do not make it an imitation of something else. It has enough virtues to render no apologies necessary for its appearance. On general principles, of course, imitations should be avoided. Originally the idea in stone structures was to hide the weakest parts—the joints. Appreciating the difficulty of this, designers adopted them later as a feature. Attempts to make concrete look like stone by making marks to imitate joints is inexcusable. Good, honest concrete need not stand as an imitation.

American Tobacco Co.'s Building, Montreal.

In a general way we think of concrete as a material good enough in appearance to be put into underground culverts or into bald, engineer-designed retaining walls. What a relief then when we find walls performing these utilitarian functions broken up by the introduction of a base course, a coping and possibly a pilaster or two, and yet professing to be nothing more than they are—good, honest concrete.

It is the ordinary custom after removing the forms from concrete exteriors to daub the outside wall surfaces over, with cement grout on a whitewash brush. A more unworkmanlike, pasty-looking, characterless surface cannot be imagined. Certainly, satisfactory surfaces are difficult to obtain, but it must be a very poor surface that a wash will improve. Plastering, also, in any form is to be condemned both on account of its lack of permanency and absence of character. The only way to obtain a reasonably uniform coloring is to have the whole supply of cement necessary for the exterior, as well as the whole supply of sand, mixed thoroughly, separately, and stored in bins to be drawn from as required. This, of course, is a difficult thing to do.

The possibilities of the material are great, but for exteriors, practical systems and designs yet remain to be developed.

The custom of using a fairly dry mortar for face work deposited simultaneously with what is called a dry body concrete or even a wet concrete, should be discouraged. In such a structure there are two widely different substances; one, mortar exposed to all changes of temperature, the other, concrete, more protected. The result is in the best of work that the hard mortar surface will crack into squares of about eight feet each way, the cracks extending to the heavy concrete backing. The writer knows of many such cases in concrete as good as to be beautifully crystalline in structure. A very rich facework mortar may set so much faster than the body concrete that a distinct cleavage crack will result. Ordinary wet concrete will give as good a surface without a facing mixture, will not crack the same way and is much cheaper.

Crazing or map cracks result from the improper floating of too much pure cement to the surface, combined with lack of opportunity to properly mature.

Interiors and Interior Finish.

For the interior of factories there is not the slightest difficulty in producing a surface right off the forms good enough for anything. In many instances too great care is demanded in the finish of surfaces because it is thought "form boards can be easily planed." Too much planing and carpentry adds materially to the cost and serves to accentuate the slight warping of the boards inevitable as soon as they are called on to retain the wet concrete. Such demands do not appear to be reasonable when the same proprietors would be perfectly satisfied with the very rough surface of an interior brick wall and the irregularities of structural steel connections and surfaces. The alignment of the forms, however, should be good.

Interiors for factories may be finished in cold water paint applied directly to the concrete and, if desired, on the lower parts of the walls a dado may be painted in oil. Take care, however, that the concrete is dried out, for the result of the combination of the paint oil and the alkalies out of the cement may give something that looks suspiciously like soft soap and it may be found next morning that the most of the dado has slipped down into the hospital cove. On dry concrete there is no trouble with oil paint.

In cases where a good finish is desired the writer does not believe in trying to get it in concrete. Make a regular plaster finish. Use rough lumber for the forms, thereby cheapening the formwork and getting a better surface to plaster on. To plaster on smooth concrete walls is difficult even with Keen's cement.

The wearing surface of floors may be of cement or other material. If of cement, the best results are obtained, if time permits, by finishing the floor immediately after making the slab and then protecting it against damage from continuing the building operations. For many purposes hardwood floors are excellent. They are best secured by embedding 2 x 2-inch screeds in a layer of cinder cement, deposited at a convenient time on top of the concrete slab and after the cinder concrete has dried out swab it with roofing tar, nail an under floor diagonally on the screeds and the hardwood to the under flooring.

In floor systems where shallowness of slab is not a consideration several types of construction have been devised. One of these, quite inexpensive and satisfactory, is of combination tile and reinforced concrete, in which between each row of tiles the reinforced concrete plays the part of a joist.

For lighter work, as for residences, slabs are now being cast in factories in lengths up to 21 feet, and widths of 4 feet, ready to span from wall to wall without beams of any kind. Metal lath fastened on the ceiling provides a sure bond for the plaster which hides the joints.

Advantages and General Discussion.

In a general way some qualities of reinforced concrete buildings obtrude themselves very forcibly. The principal of these are fire-resistance, absence of vibration, increasing strength with age, rigidity and economy.

Instances of the fire-resisting qualities of reinforced concrete buildings are numerous. The great conflagrations, as well as individual fires, bear testimony to this virtue. A consideration of the nature of the members shows clearly why this is so. A natural stone, if heated to say 1,500 or 1,700 degrees F. is apt to crack from end to end or to continue spawling off until the bulk of it is removed. Steel if heated to such temperatures reddens and is unable to bear any load. Good concrete only dries out and continues by non-conduction to preserve the interior steel from heat injury.

American Tobacco Co.'s Building, Montreal—Interior of Stable.

The writer is frequently asked about the safety of reinforced concrete buildings when heavy vibrating machinery is placed on upper floors. There is practically no vibration. He knows of one building in which batteries of trip hammers are at work about the fifth floor and no difficulty is experienced. In another building high speed, heavy chopping machines are at work and in the floors above and below the occupants know nothing about it from noise, vibration or in any other way. In the Kitterlinus buildings in Philadelphia there is an interesting comparison of two buildings used for printing machinery and the like. One is of steel, the other of reinforced concrete. In the former the vibration is considerable while in the latter it is scarcely perceptible. The sound proofness is also remarkable.

It cannot be said that any type of building other than reinforced concrete improves with age. Some types remain as strong as when new but none except concrete increase in strength. For this reason the contractor himself runs probably more risk with his building than anyone else. He has the structure in its tenderest stages and it is not recorded as far as the writer is aware that difficulty in the matter of strength has ever occurred after the building left the contractor's hands. True, many accidents have happened, but we believe these have in almost every case resulted from the premature or improper removal of forms.

That reinforced concrete buildings possess a remarkable amount of rigidity or power to act as a unit is well known. Explosions have occurred in them without serious damage to the structure. One of the columns supporting a loaded coal pocket in France was accidentally knocked out by a derailed locomotive—but the loaded coal pocket with its thousands of tons of coal did not come down. Two grain warehouses in Tunis, having settled about 25 degrees out of plumb through the escape of quicksand on which they were built were loaded down with sand on their high side and thus with the assistance of excavating beneath the high side were brought back to the vertical without developing a crack in the structures.

As to the cost, it is impossible to give general figures other than to say that the actual cost depends altogether on local conditions and requirements. Everything being equally favorable for say steel and reinforced concrete, the cost may not be materially different, although the writer is aware of heavy reinforced concrete buildings that have been completed for 10 per cent. less than the tendered price for the same in steel. As to formwork itself, the cost of it may be made to run from 25 per cent. to 75 per cent. of the total cost of the concrete work.

Conclusion.

In the present state of the art, the highest type of a reinforced concrete building is that with a brick or stone exterior. What may be evolved in the next few years no one can say. At the present, we cannot fully understand and appreciate some of the unusually excellent results obtained in tests, but it is only a matter of time, with the co-operation of the architect, the engineer, the laboratory expert and the concrete exponent, when we shall know all about them and how these results are to be obtained in daily practice. The system has developed fast and is still developing. Development means modification, and who can say what the final result may be? Enthusiasts are spending their lives in trying to perfect new cements. Capital is being added to the general industry daily. Already hundreds of millions of dollars worth of buildings have been built of this new type in a few years. One firm of specialists alone has erected over 25,000 reinforced concrete buildings. The subject is receiving the attention of all the leading scientific bodies in the engineering world. That it is sound engineering to make haste slowly along well tried lines, however, no one will deny.

The subject is a large one and constantly growing. Possibly an appropriate closing remark of this brief discussion is a definition of reinforced concrete, namely Portland cement, sand, stone, water, steel and—brains.

The proper and careful use of printers' ink is a great assistance in the sale of any product. Keep your company and your specialty before the people; be instant in season and out of season, and when they are in the market their minds will at once revert to you and your product by the law of "association of ideas." Study where you fail; your strong points will take care of themselves. Therefore, find out what your weak points are and strengthen them. Cut out your negatives. Say what you mean, and mean what you say!

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Return Air or Inside Circulation.

There are two ways of obtaining circulation of air within the rooms to be heated. One is by the use of cold air from the outside to supply the furnace, used in connection with a ventilating flue of sufficient size to carry the cold air on the floor of the building out as fast as the hot air comes into it. Another way is to use the return system, and provide cold air outlets at the floor of every room in the house, and conduct this cooled air back to the furnace for its supply to be heated.

The difficulty in getting good circulation with the first plan in connection with outside cold air to the furnace is that the ventilating flue of sufficient size is not furnished, and the different rooms are not connected to it by pipes of proper size to get the circulation. Please bear in mind that we assume that all agree that it is absolutely necessary to have circulation of air to heat properly. A cold air supply from the outside to a furnace is only one part of a ventilating system, and it is necessary to have a proper connection to a ventilating flue of ample size to get the circulation which gives the desired results.

My observation has been that too often in heating residence buildings those who use outside air to supply the furnace have ignored the principle of circulation of air, and have not provided for it by using proper connections to a ventilating flue, and by so doing, try to heat without circulation and fail.

Vent Flue Must be Heated.

A ventilating flue to be effective and to be depended on for circulation under all conditions of atmosphere must be heated. It will not do to depend on outside walls, cold attics and cold ventilating flues for circulation. Hence I claim that it is not enough to supply a cold air from outside to a hot air furnace, but provision must be made for ventilation in connection with it.

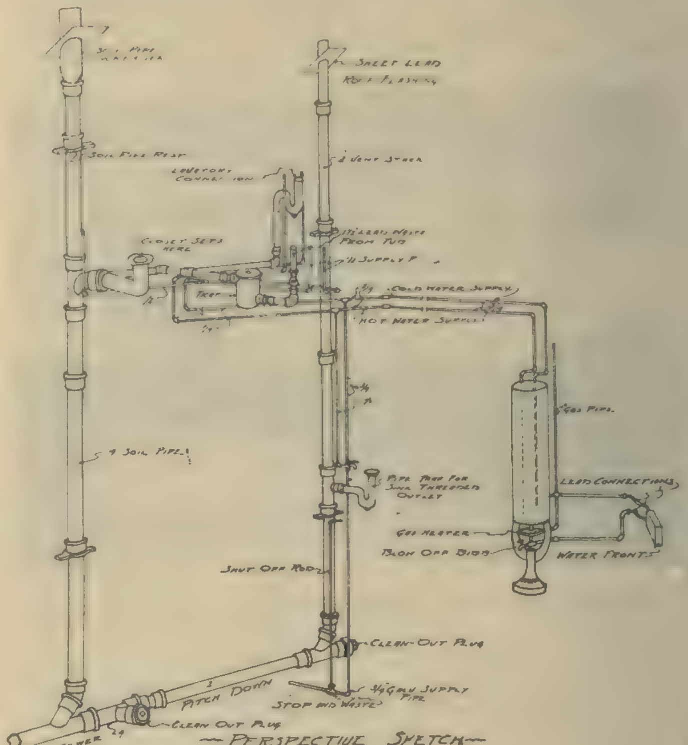
You will undoubtedly agree with me that this is not practical in common residences, and that the owners will not furnish the ventilating flue of proper size, and instead of putting the furnace in with an outside cold air and no ventilation, why not put in the return system and take no chance on properly heating the house and at the same time furnish ventilation far in excess of that furnished by any other method of heating, except the ventilating system of which I have spoken?

We admit that the ventilating system of which the cold air from the outside is only one part is not practical for small houses.

Now, why not do the next best thing and put in a job that is practical and install our cheap furnace jobs, so that they will heat, no matter from which direction the wind comes, and so that the dirt from your neighbor's back yard or the street will not be constantly sucked in through an outside cold air and sent up into the house through the hot air pipes?

This can be accomplished by using the return system. It is not enough, however, to have only one cold air face in the hall, but you should have the cold air faces so located that all rooms on the first floor will have easy access to them, and so that the cold air on the floors will not have to be drawn across the floors of two or more rooms before they reach the cold air faces.

We seldom use less than three cold air outlets on the first floor for an ordinary eight or ten-room house, using the largest one in the reception hall on account of the cold air from the second floor naturally settling into the hall. This plan of installation will give good results, provided the combined area of the three or four cold air faces, as the case may be, are equal to the combined area of all the hot air pipes.



—PERSPECTIVE SKETCH —OF— COMPLETE PLUMBING SYSTEM—

The best place to locate the cold air outlets is on the same side of the room that the hot air is located, and may be side by side if preferred. It is just as important to have the cold air pipes short as it is to have the hot air pipes short, and just as important that they slope downward as that the hot air pipes slope upward. A heating plant installed in this manner will not be affected by the wind; it will make no difference from which way the wind blows, all rooms will heat equally well.

It is true that it costs more to install a furnace this way, but it is worth more after it is done, and will be a credit to the business in general when it is done, and in my judgment nothing would strike the hot water and steam man such a knockout blow as for all the leading manufacturers of hot air furnaces to insist that their furnaces be installed in this manner. We can put them out of business in five years, as far as residence heating is concerned, if we will just insist upon having our furnaces installed properly.

Good Prices Necessary for Good Work.

A man will not pay from $400 to $600 for heating a house if he can get it done for from $200 to $300. It is not necessary to do it for from $90 to $125 to secure the business. If a man has ever lived in a flat building where the furnace was installed as the average competition work is installed, no amount of talk, even if it is by a hot air man, and pretty windy at that, can convince him that any hot air furnace is a suitable thing to be put into a house in which a white man lives. And, gentlemen, I believe that we are driving another nail into our coffin every time we sell our goods to be installed for less money than it can be done properly.

Our company never gets much of this so-called real estate or competition work, and we do not want it for two reasons. One is, there is not enough profit in it, and the other is that we would be afraid of its hurting our reputation.

Now, I firmly believe that if this association, or all the leading manufacturers of hot air furnaces, would settle on what good installation consists of, and insist on having their salesmen and their agents follow the same, that we could go to the architects of the country and demand of them that their plans call for certain things when hot air furnaces are specified, and the small dealer or manufacturer would be forced to install his furnaces better and the demands for hot air furnaces would be very much increased in a short time, and eventually would displace hot water and steam for common residence work, for hot air furnace heat is the best known method when properly installed.

I do not claim that a house cannot be well heated by using outside cold air in connection with a ventilating flue, but I do claim that it cannot be done in a satisfactory manner without proper connections to a heated ventilating flue, for the reason that the circulation will not be good. In my opinion, it is not practical, for the reasons given above. I believe that the practical, common sense thing to do is to use the return system and eliminate many of the objections no raised to hot air heating.

Unite to Place Furnaces on Proper Basis.

I would be glad to join in a united effort of some kind to establish furnace heating on a basis that it should be. One manufacturer cannot do much alone, and there cannot be much accomplished if we pull in opposite directions. It is concentrated effort that is needed.

Suppose every one of our salesmen would carry a copy of resolutions passed and signed by all the leading manufacturers, that furnace work must be done so and so; would it not have its weight, and would it not be hard for the outsider to get the work to be put in, in an inferior way, even though his price was less? My theory is that the worst curse to the hot air furnace business of to-day is that of the general idea that it is cheaper and that in the face of this we are fools enough to see who can sell for the least money. If the word could be circulated broadcast that hot air furnace heating has become a science, and when scientifically done costs more money than formerly, but is the best known method of heating a modern home, and then eliminate the cheap work, it would be a great boom for the business.—W. J. Heald, in the "Engineering Review."

A cast iron column 8.8 inches diameter and 13 feet high begins to yield under a load of 84.4 tons at a temperature of 1,137 degrees of heat.

Logical Rules for Furnace Men.

The problem of warm air furnace heating and ventilating is a fascinating study, and the more we indulge in this study the more interesting it becomes, says the Journal of Modern Construction.

The basic or underlying principle that governs the experienced furnace man is a strict adherence to the rules entering into the problem, and if his conclusions are reached by those rules on a logical basis, instead of the use of "thumb rules," failure and condemnation will be replaced by success and commendation, and the agreeable outcome of success and commendation is increased business and larger profits.

One of the first rules a furnaceman should learn is that of determining the amount of cubic feet of air space to be heated, and in this calculation it is necessary to take into consideration the relation of exposed walls and exposed glass surface to the room or building to be heated. Some consideration, too, must be given to the relation of an adjoining unoccupied property, the loss of heat by transmission in this party wall must be overcome by a proportionate allowance in the total equivalent cubic feet or in the capacity of the furnace, for extra firing when that feature becomes necessary.

A simple rule for determining the equivalent cubic feet is, to the cubic feet in each room add for wall and glass exposure as follows (one-tenth of each square foot of wall exposure being equal in cooling effect to seventy five cubic feet, and one square foot of glass exposure being equal in cooling effect to seventy-five cubic feet):

First, obtain the cubic feet by multiplying the length by the width of the room and by multiplying this result by the clear height of the ceiling.

Then multiply ten per cent. of the net wall exposure by seventy-five, and add this amount to the total cubic feet.

Then multiply the glass exposure by seventy-five and add this amount to the total cubic feet, and the cubic feet, the multiplied ten per cent. of the net wall exposure, and the multiplied glass exposure will constitute what may be called equivalent cubic feet; that is to say, the total will be equal to the cubic feet to be considered in determining the size of the furnace, the size of the warm air pipes and the size of the registers that will be required to heat the house.

It is reported that asbestos has been discovered near Eastman, Quebec, and that several companies have organized to develop the new mines. The Orford Mountain Railroad is near these properties, and a spur will be built from the main line to the mills, which are already in course of construction. This discovery is important, as bearing on the extent of the asbestos fields in this province. The mines near Danville, Quebec, some 65 miles from this new find, and at Thetword Mines, Black Lake and Broughton, Quebec, and several smaller places on the line of the Quebec Central Railway, about 100 miles from Eastman, are now the only producers of this mineral on this continent. The development of these new mines will induce more thorough prospecting all over the eastern townships.

The year 1908 marked one of the most remarkable periods in the growth of Moncton, N.B. With the new Transcontinental tracks laid within the city's boundaries, the new I.C.R. shops almost completed, $200,000 worth of new buildings erected, new streets opened out and the almost entirely new west end district developed, it can be readily seen that the growth in 1908 has been very extensive.

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

A Double Span Reinforced Concrete Bridge.

The Queen's Bridge herein illustrated is built over Kettle Creek on the boundary line between the city of St. Thomas and the county of Elgin. It consists of two spans of 80 feet in the clear with a 16-foot roadway. It is designed to carry a live load of 150 pounds per square foot of floor or a concentrated wheel load of 15 tons on two axles ten feet centres.

The foundations of this bridge extend four feet below the bottom of the creek, the foundation material being very hard, so that there was no danger of any settlement. The radii of the extrados of the arches consist of three curves 100, 18 and 4 feet respectively, and the extrados 150 feet. The depth of the arch at the centre is 22 inches.

The concrete below the springing line was specified as one of cement to nine of sand and gravel, with the privilege of using large stones placed so as not to touch each other and not nearer than four inches to the outside. The composition of arches above the springing line was specified as one of cement, two of sand and four of broken stone or screened gravel. The spandrel walls were one to six of pit gravel, and the floor one of cement to two of sand and three of broken stone, with the covering of 1½ inches, of one of cement to one of sand and two of broken stone.

The arches of this bridge are reinforced with Johnston's corrugated bars placed on the intrados at nine inches C.C. and on the extrados the same, these bars being connected alternately every five feet with half-inch bars hooked over each. One-half-inch cross bars were also placed three feet apart and wired to the two lines of longitudinal bars. The wings are reinforced with half-inch bars placed three feet apart both vertically and horizontally.

The forms for all exposed surface were planed and then given a coat of oil. The indentation of the panel work is two inches, and in order to ornament the work and break the monotony of having a plain side, an overhang was placed six inches below the top of the spandrel wall extending out four inches.

The main posts of the bridge were built up after the spandrel walls were properly set, the railing and balusters being built separately and placed in position after the whole of the other work was completed and the centreing removed.

The cost of this bridge, together with filling in and gravelling the approaches, and fencing, was $9,433.20. The bridge was designed by Jas. A. Bell, C.E., acting for both city and county, and the work of erection was under the charge of Geo. N. Otty, B.Sc.

The Queen's Bridge Over Kettle Creek.

Municipalities and Good Roads.

Mr. A. W. Campbell, Deputy Minister of Public Works for Ontario, addressed a meeting at Galt, Ont., recently on the subject of "Good Roads." Mr. Campbell said in part:

"There is an impression abroad that the good roads movement means that there must be drawn out by the Department of Public Works a specified plan which is to cost a certain definite amount. I want you to distinctly understand that the department does not dictate or lay down any plan. It simply says that when the County Council designates certain roads to be improved they must go ahead and improve them according to their own idea and the Government pays one-third of the cost. It is surprising the number of people who are opposed to the system because they imagine that the good roads are going to cost more than they can afford. If you say that you will have your roads cost $600 a mile we will pay you $200. If they cost $3,000, we will pay $1,000. If you become extravagant and think you ought to have roads costing $4,500 a mile, we will endeavor to pay $1,500. The point I wish to make is this: When a county system is established we expect the Council to use sound judgment in determining what improvements to make and what they will cost, and we will pay one-third.

"In the last ten years in Waterloo County there were 273,910 days of statute labor. It was worth at least $1 a day. Then you should have made improvements on your roads to the extent of $300,000. If you have not you haven't the results that might be expected. Last year Waterloo County spent $225,569 on the roads besides the statute labor. If I had suggested that you spent that amount ten years ago you would probably have thrown me out of the window. That is a total of half a million spent since I was here last, yet an examination of your roads would reveal very little improvement.

"Don't raise money by debenture. Do not overtax, but get a system that will give returns for your money. If I had that money to expend in ten years I would macadamize every rod of road in Waterloo County. Do you understand the position? Do not allow any council to impose higher taxes. It simply means a greater waste. When a proper business system is laid down by the council the money is expended in a manner giving the best results.

"Now, what do we find? There are in the county 453 pathmasters. There is no general plan. You send the pathmaster out on his particular beat and he makes the road as he sees fit. In every ten miles there are five different pathmasters and consequently five different ideas. One believes that a road should be fourteen feet wide and the other makes it from fence to fence, but still one is as honest as the other. The fellow with the narrow idea is followed next year by a man with a wide idea, and he spends all the money in widening the road. If you will study the question yourself you will find no part of the municipal tax so squandered as that for roads.

"In Ontario in the last ten years 16,000,000 days and $21,000,000 was expended on road work. If I had that time and that money at my disposal I would enter into a contract to macadamize every road in Ontario.

"You should make roads to meet the requirements of travel. You must design the roads yourself. We cannot do it for you. Do not alter the lines of travel. Leave the roads just as they are, but improve them. Provide for what you can afford. Get some one with experience in road-making. Building roads is a most simple thing, but a most worrying thing. Let us have a township plan for a system of roads. Find out what is needed, and spend it on the roads decided upon. Any system to raise more money would be opposed by me.

"If you continue your present method, it will simply be patch and repair. The whole fault is in the system and not in the money expended. You must have tools. The council can buy the machinery and you have lots of material to put on crushed stone six inches deep and eight feet wide, which would cost about $800 per mile. In Simcoe County the roads cost about $800 per mile, and conditions in Waterloo are very similar. It would be well for the Waterloo Council to appoint a committee to visit Simcoe and see what they are doing in that county. They have 440 miles of road, and the Government has paid $115,000 towards these good roads. We do not suggest more expensive work, but more methodical work. Build one mile a year. The Government does not pay one-third of the cost to relieve the people of taxation, but to encourage the making of better roads. We do not try to induce the councils to take up the system, but we assist in every way we can. Go as fast or as slow as you wish.

"The three principles of road making are: 1, Drainage; 2, drainage; 3, drainage. First crown the road, then make ditches to contain the water and see that they have natural outlets. Proper shaping and crowning is the most important in Dumfries. Expensive roads are not necessary. Six inches of crushed stone eight feet wide is just as good on this lane as sixteen inches is in the clay of Oxford. You have the best conditions in Western Ontario for inexpensive road making."

Toronto merchants are making serious objection to the moving picture buildings, on account of the continual music and the fear of fire.

The Goods Roads Problem in the West.

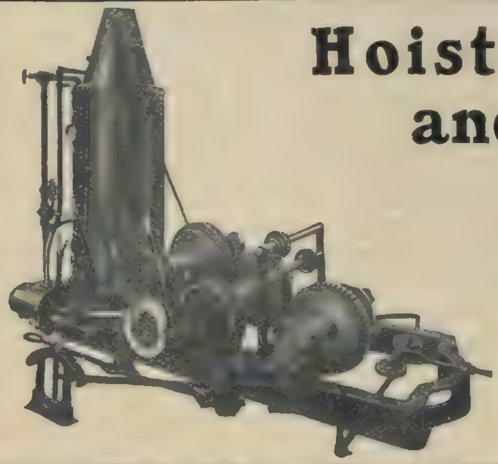
The council of Kildonan, Man., are asking for Government assistance in improving its roads leading into the city of Winnipeg. Mr. A. R. Bredin, reeve of the municipality, states that in his opinion gravel will solve the problem. They have been experimenting for two years with this material, and the result has been most satisfactory. 1,300 yards have been put on one and one-quarter miles of roads. The cost in the municipality is $1.25 per yard, delivered on road, and one man's time for measuring, extra. This has been placed on the Kildonan east road, and although the past season has been a very trying one on the experiment, it has stood the test to the satisfaction of the most sceptical. Building permanent roads in any country is an expensive matter and should not be done by direct taxation. The money will have to be raised by an issue of debentures, covering a period of at least twenty years. At the present time the borrowing power of rural municipalities is so limited by the municipal act that legislation would have to be obtained to enable them to issue debentures to cover the cost of any system of permanent roads decided on. Drainage, of course, is the first thing to be considered in the construction of any permanent system of roads, and it would be useless to put gravel on any grade before the ditches on either side of the same were taken out to the grade from one outlet to another. Mr. Bredin thinks a readjustment of the boundaries of municipalities surrounding Winnipeg is desirable for the purpose of drainage and road improvement, in order that the cost may be levied in an equitable manner on the property benefited."

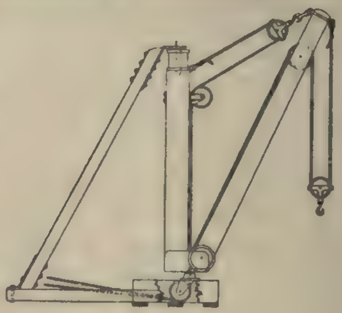
Mr. Joseph Maw, in a letter upon the subject says: "Not only should the people of Winnipeg interest themselves in good roads, but every municipality in Manitoba and our provincial government should take hold and meet the proposition ,and no doubt they would do so if the matter were brought fairly and squarely before them. The Provincial Government would not necessarily build all roads to Winnipeg; but let them build a highway from Winnipeg to the western boundary of Manitoba; another from Winnipeg east as far as there is good, arable land; a third from Winnipeg south to the United States boundary; and a fourth from Winnipeg north. Then the municipalities should step in and build branch lines, or feeders."

Canadian Pacific Railway Expansion.

Thirty million dollars has been mentioned as the amount the Canadian Pacific Railway will appropriate toward western extension this year in the building of numerous branches and connecting lines as feeders to their great main line carrier. The Grand Trunk Pacific and Canadian Northern have hundreds of miles of graded and surveyed work in hand, and are negotiating for the purchase of terminal properties at Calgary for a union station. The Great Northern Railway—the Hill system—will, it is expected, be into Winnipeg by midsummer, as from an official announcement the central property purchased by this country two years ago at a cost of over $2,000,000 is being cleared and put in readiness for the erection of magnificent terminal buildings. The network of steel being laid in the Province of Manitoba is as essential to its agricultural and industrial development as a network of streets to any city. And farms that are being brought within easy reach of railway accommodation are steadily advancing in values.

Brick are elastic, taken individually, and likewise piers display elastic properties. They shorten when loaded and spring back, in whole or in part, when unloaded.





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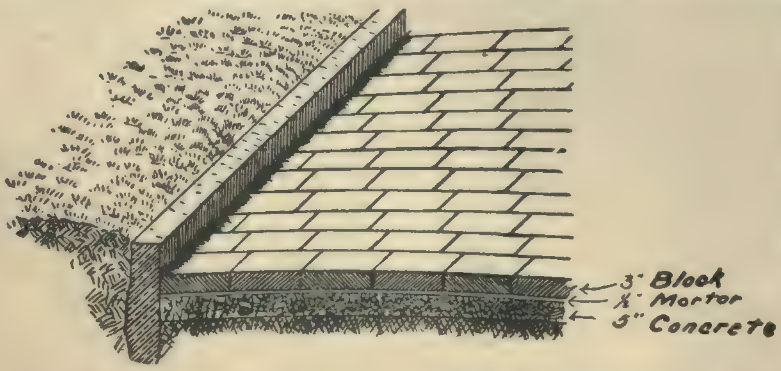

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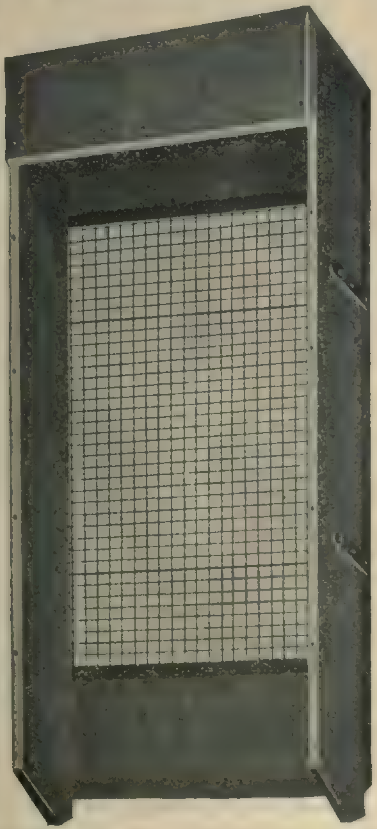

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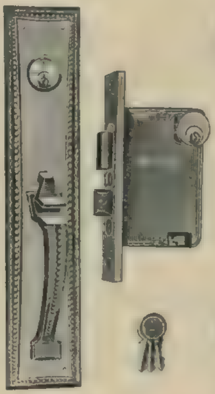

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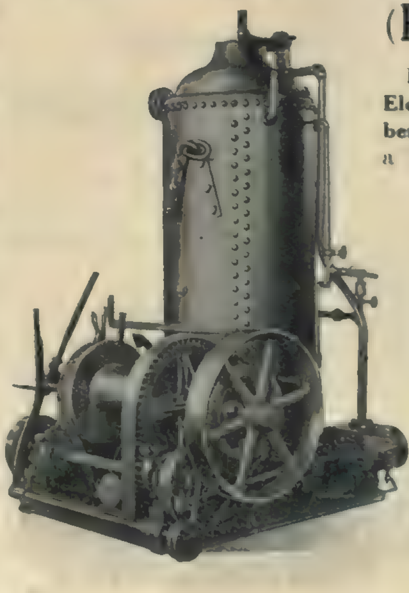

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17	Cemeteries, Vaults, Tombs and Greenhouses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and FireHouses	208,664	28,837
656	Total 1st	12,800,281	4,660,766
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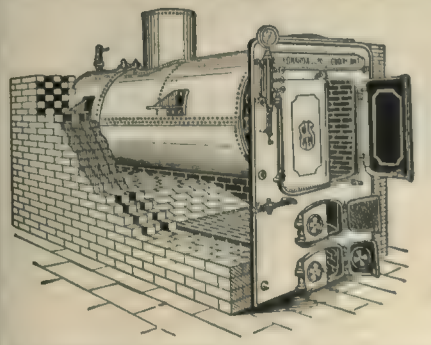

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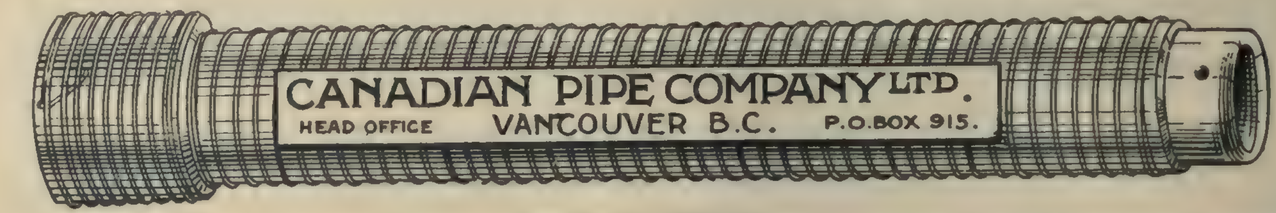
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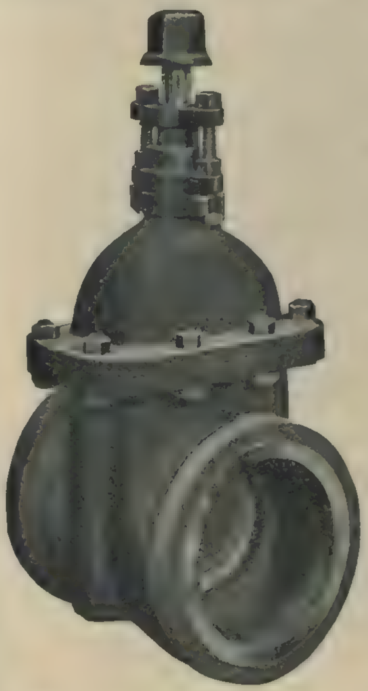

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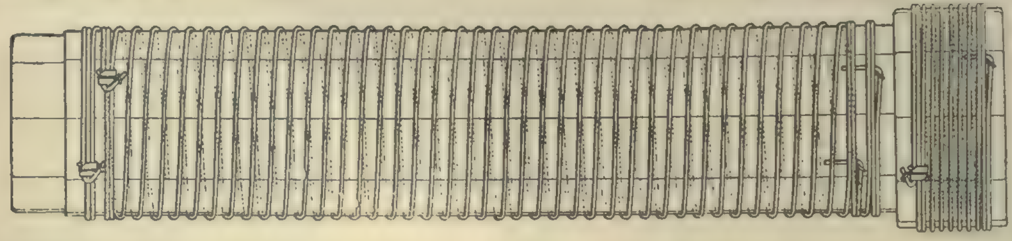

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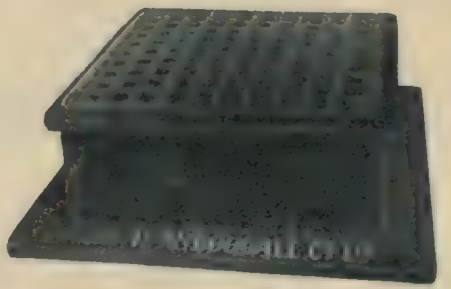

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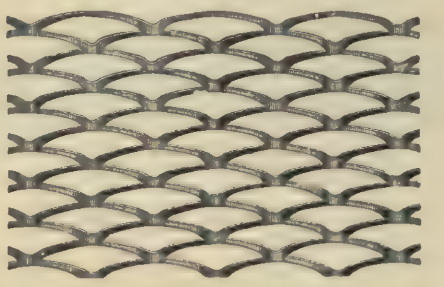

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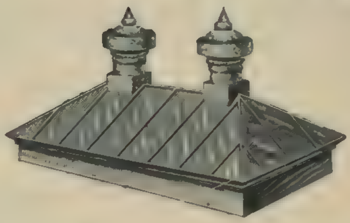

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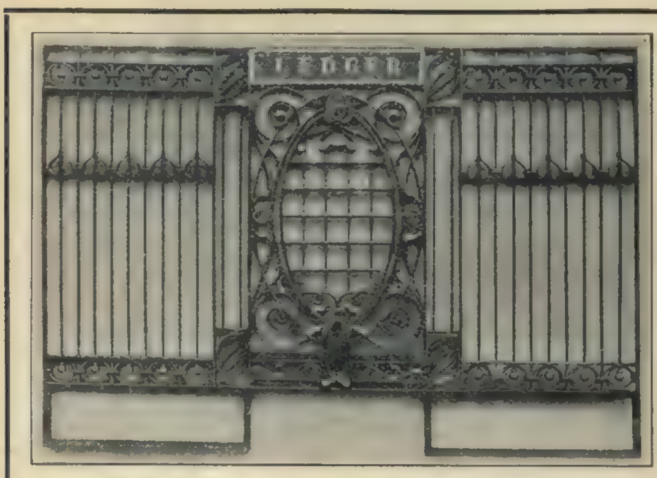

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Capacity 5,000,000 Imperial gallons in 24 hours

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3 phase—60 cycle—2,200 Volts

This Pump and Motor combined or separate are offered at a very low price.
Full particulars to those interested.

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¶ Therefore every time you buy a **yard** of our stone by **weight** you save **200** lbs. Not only on cost of stone paid to us but also on your freight bill.

¶ We GUARANTEE this **claim** and also your **satisfaction** with our Stone.

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Toronto, Ont.

The Park Commissioner purposes making many improvements in the parks this year. Among these are the following:—High Park—new roadway, cut off to avoid dangerous hills near picnic grounds, $7,500; Riverdale Park—macadamizing and draining roadway from Broadview avenue to Don Mills road, near C.P.R. bridge, $2,500; Rosedale Ravine—cutting down grade on Roxborough hill leading to Ravine drive $6,000; connecting eastern end of ravine by suitable driveway on Don Flats, with easy grades, $25,000.

Plans for the proposed filtration plant are stated to be now ready.

Mr. Fellowes, Water Works Engineer, states that in order to provide proper water supply for East Toronto it will be necessary to extend the city's high level system.

Saskatoon, Sask.

Tenders will be received by the City Clerk until February 24th for furnishing and erecting a pumping engine with a capacity of 1,200 to 1,500 U. S. gallons per minute. Further particulars may be obtained of the Chief Engineer, Willis Chipman, 103 Bay street, Toronto.

Victoria, B.C.

A proposition has been made before the City Council to get a water supply from Sooke lake. The Canadian Agency, the company which has the project in hand, has already sent an engineer over the ground to secure preliminary estimates. They will undertake to construct the pipe line, which will cost approximately $1,200,000, including attendant structures. It is estimated that the work of constructing this pipe line would take nearly two years.

AWARDED.

Calgary, Alta.

$777,000 bonds issued for water extensions, sewers, local improvements, etc., have been awarded to Wood, Gundy & Company, Toronto.

Railroads, Bridges and Wharves

Cape Bald, N.B.

Tenders will be received by N. Tessier, Secretary, Department of Public Works, Ottawa, until February 17th for the construction of a breakwater at this place, according to plans and specifications which may be seen at the offices of E. T. P. Shewen, Resident Engineer, St. John, N.B.; Geoffrey Stead, Resident Engineer, Chatham, N.B., on application to the postmaster at Cape Bald, N.B., and at the Department of Public Works, Ottawa.

Edmonton, Alta.

D. D. Mann, Vice-President of the C. N. R., was recently in the city and stated that at an early date a line would be constructed from this city northwest to Fort Assiniboine on the Athabasca river and eventually to Lesser Slave Lake and the Peace River Crossing. It is understood that the C. N. R. will build a line from a point near the eastern boundary to Edmonton, north of the Saskatchewan river. Another line will probably run from Strathcona to Calgary. All three lines will have terminals in this city. Other important extensions are contemplated.

Gowganda, Ont.

Mr. L. O. Armstrong, of the C. P. R. service at Montreal, has returned to that city after a visit to this district and has made a report to the company in favor of the construction of a line eighty miles in length.

C. N. R. surveying parties are going over this territory locating possible routes. Mr. Wm. Mackenzie, President of the C. N. R., and J. T. Tyrrell and Engineer Wickstead, of the C. N. R. surveys, were recently in Gowganda on a tour of inspection.

Hamilton, Ont.

The Railway Board have made an order that the T. H. & B. and the C. P. R. shall file plans within a month for the construction of a modern bridge over Garth street. City Engineer Barrow states that the order only calls for a wooden structure; if a steel bridge is wanted the city will have to bear a larger proportion of the cost.

Montreal, Que.

J. W. Schwitzer, engineer for the western lines of the C. P. R., is preparing plans for the reduction of the grade on the Crow's Nest Pass line between Hosmer, B.C., and the summit of the Rocky Mountains.

President Mackenzie, of the C. N. R., was recently in this city and stated that the line from Ottawa to Hawksbury would be completed this year, and active work continued on the line from Hawksbury to Montreal. It is understood that as soon as the Canadian Northern line between Port Arthur and Parry Sound is completed, Mackenzie & Mann will take over the Canadian Atlantic branch from Parry Sound to Ottawa, now owned by the Grand Trunk. This will give the Canadian Northern a through line from the Rockies to Montreal.

Ottawa, Ont.

The Nepean Bay section of the new acqueduct is practically completed. It is the intention of the power owners to shortly raise the level of the bay by a foot and a half by utilizing stop logs, and as this would flood out the coffer dams of the acqueduct, operations are being rushed. The cost of this section will be about $50,000. An expenditure to that amount has been authorized by the Railway and Municipal Board and application will be made for authority to finish it by constructing a canal down Ottawa street and on to the pump house.

Application was made by Mr. Hodgins to the Carelton County Council to provide for an application to the Railway Commission on behalf of the townships of Huntley and March to enforce the G.T.R. to construct a subway under the road lying on the boundary of these two townships.

Petrolia, Ont.

Tenders addressed to G. V. Wyatt, Township Clerk, will be received until February 5th for two concrete abutments and steel superstructure for the Montgomery bridge over Bear Creek. Full information may be obtained from C. A. Jones, Township Engineer.

Port Arthur, Ont.

It is announced that the C. N. R. have decided to connect their western and eastern lines by the construction of a road from Port Arthur to Parry Sound.

Quebec, Que.

Mr. Thos. Murray, formerly member for Pontiac County, has submitted to the Colonization Department a project for the construction of a bridge over the River Quinze in Temiskaming at an estimated cost of $30,000. It is not likely that the proposition will be considered this year, as the Department is about to carry out extensive works of colonization and roads in that district.

J. G. Scott, formerly general manager of the Quebec & Lake St. John Railway, states that several large capitalists are prepared to construct a graving dock in this city, provided that certain changes are made in the Government's method of granting aid. The matter has been laid before the Quebec Harbor Commission by the Board of Trade, and the representations of the Commission are now before the Dominion Government.

Regina, Sask.

Balfour, Martin & Casey, Regina, are attorneys for a company seeking a charter under the title of the Saskatchewan Central Railway, which proposes to build five branch lines in Saskatchewan over 1,000 miles in length.

Revelstoke, B.C.

Tenders for the construction of a triffic bridge across the Columbia river at this place close February 8th with F. C. Gamble, Public Works Engineer, Department of Public Works, Victoria, B.C.

Stratford, Ont.

A recommendation has been submitted to the City Council in regard to the site of the proposed new G. T. R. bridge.

Toronto, Ont.

City Engineer Rust in his estimates will recommend the construction of a new bridge over the Don at Winchester street. The new structure will cost $15,000.

It is stated that plans are under consideration of Mackenzie & Mann interests for the construction, at an expenditure of more than $10,000,000, of lines which will give the Canadian Northern Railway Company an all rail route from Quebec city to points west of Edmonton. The initial construction will be the closing up of the gap between Port Arthur and Sellwood Junction, the present terminal of the C. N. O.

Railway, a station situated almost due north of Sudbury, thus giving through connections between Toronto and the west. When that is completed a line will be run to Ottawa from the present Toronto-Sudbury branch.

City Engineer Rust has completed plans for the new bridge at the foot of Bathurst street, and it is expected that tenders will be taken shortly.

Vancouver, B.C.

Plans are now being prepared by Waddell & Harrington, the city's consulting engineers, for the new bridge to be erected on Cambie street. It is expected that the completed plans will be submitted this month.

Winnipeg, Man.

It is announced that both the Great Northern Railway and Northern Pacific Railway will operate in Manitoba under the charter of the Midland of Manitoba. The company has also applied for permission to build a line from Portage la Prairie westerly to Elkhorn, Man., on the Saskatchewan boundary. This line will connect with the lines of the subsidiary companies of the Great Northern which tap the trunk system south of the international boundary. James Fisker, Winnipeg, is attorney for the company. It is stated that the line between Winnipeg and St. Paul will be in operation this year.

Tenders addressed to P. E. Ryan, Secretary, Transcontinental Commission, Ottawa, will be received until March 10th for the construction of railway shops east of this city. Plans and specifications may be seen at the office of Mr. H. D. Lumsden, Chief Engineer, Ottawa, and Mr. S. R. Poulin, District Engineer, Winnipeg.

Yorkton, Sask.

A deputation from this town recently waited upon the C. P. R. officials at Winnipeg to try and secure the erection of a new station and the establishment of a divisional point. The matter is in abeyance.

Public Buildings, Churches, Schools, etc.

Brandon, Man.

The parishioners of the St. Matthew's Anglican church have purchased a site for the erection of a new building.

Beaverton, Ont.

At a meeting of the Beaverton and Thorah councils it was decided to submit a by-law at an early date for the erection of a new $12,000 municipal hall.

Calgary, Alta.

Owing to a disagreement between the railways and the Government, it is not likely that a union station will be erected here. As a matter of fact the C. N. R. have already approached the Eau Claire Lumber Company with a view to securing the mill site, adjacent to the N. W. M. P. barracks, the property for which they were negotiating with the Government.

Fernie, B.C.

At a recent meeting of the City Council it was decided to take tenders at once for the erection of the new municipal buildings.

Galt, Ont.

The Canadian Potato Machinery Company, Limited, a branch of the Champion Potato Machinery Works, of Hammond, Ind., have purchased a site here for the erection of a factory, which will be built at once. W. H. Schrieber, late of Hammond, Ind., will be resident general manager.

Guelph, Ont.

The I. O. O. F. contemplate the erection of a large solid brick building of imposing appearance on some good site in the city, with the ground floor for business establishments, the second floor for a Y. M. C. A., and the third floor for the I. O. O. F. lodge rooms.

Halifax, N.S.

It is expected that the construction of the St. Edward's Church building, for the West End Catholics, will be undertaken this season. The new building for the Home of the Guardian Angel, the Catholic infants' home is also expected to be erected this summer. Plans have been prepared for the latter building, which will be of concrete construction.

The contract for the new children's hospital will shortly be awarded.

A project for the erection of science and library buildings for Dalhousie University is being considered by the authorities of that institution.

Hamilton, Ont.

It is rumored that the G. T. R. are purchasing property in Cannon street east with the view to the erection of an uptown station.

The Markets Committee are asking for an appropriation of $22,627, which amount includes the following items: Jail, $7,427; markets, $6,500; city hall, $5,200.

It is expected that within a short time construction will be started on a new building for the Y. W. C. A., to cost in the neighborhood of $33,000.

Ingersoll, Ont.

A movement is on foot to raise $12,000 for the erection of a general hospital.

London, Ont.

The erection of a new Roman Catholic church in South London is contemplated.

It has been decided to erect a new school building in Chelsea Green early this spring. The building will contain two rooms, with a seating capacity of two hundred, and will cost in the neighborhood of $3,000.

Leamington, Ont.

A new two-storey opera house will be erected here in the spring by J. M. Henry.

Mount Forest, Ont.

Dr. A. R. Perry, of Conn, has purchased the residence formerly owned by Mr. A. M. Martin and will at once convert it into a private hospital, making considerable alterations.

Maple Creek, Sask.

Tenders closed February 1st with N. Tessier, Secretary, Department Public Works, for the installation of heating apparatus in the public building at this place.

Moose Jaw, Sask.

It has been definitely decided to enter upon the construction of the new Y.M.C.A. building this spring.

At a recent meeting of the Y. M. C. A. directors it was decided that the erection of the new building would be commenced this spring.

Montreal, Que.

The Grand Trunk Bonaventure Station was damaged by fire recently to the extent of $6,000.

It is reported that the Sparrow Company will rebuild the Academy of Music on the northwest corner of Bleury and Major streets, if their present building is razed for the proposed extension to the S. Carsley Company's building.

The Corporation Ecole Hautes Etudes H. Mercier, 216 New York Life Building, have taken out a permit for the erection of a school at the corner of St. Hubert street and Viger avenue at a cost of $240,000. Architects, Gauthier & Daoust, 180 St. James street. Contractor, Jos. Bourgue, Hull, Que.

Ottawa, Ont.

The matter of enlarging the court house was brought before the Carleton County Council last week by M. J. Gorman and A. E. Fritt. Mr. Gorman stated that estimates had already been prepared placing the total cost of the required addition at about $20,000. Warden Dow, on behalf of the Council, promised due and careful consideration.

A deputation from the Ottawa Valley Medical Association waited upon the Carleton County Council last week to urge the necessity of establishing a sanitarium for Carleton, Lanark and Renfrew counties. Dr. Groves, of Carp, in presenting the matter to the Council stated that the Ontario Government gave a grant of $4,000 to every county that established a sanitarium, consequently the three counties would receive a total grant of $12,000. This sum however, would be quite inadequate and the Council were asked to make application to the Ontario Legislature for a larger sum. Early consideration was promised.

Tenders addressed to E. McMahon, 26 Sparks street, Ottawa, will be received until February 12th for the construction of a reinforced concrete grand stand, to be erected on the grounds of the Central Canada Exhibition Association. Particulars on application.

Owen Sound, Ont.

Tenders for the construction of a solid cement manse at Sydenham twonship will be received until February 15th by George Wilkinson, Secretary-Treasurer, Hoath Head. Plans and specifications may be seen at the Queen's hotel in this town.

Palmerston, Ont.

A new Roman Catholic Church will be erected here in the spring.

Peterborough, Ont.

The congregation of Murray Street Baptist Church are considering the erection of a new building. Mr. W. Aldridge is Financial Secretary.

Port Arthur, Ont.

Competitive plan s are invited until February 20th by J. W. Morgan, Secretary-Treasurer of the Collegiate Board, for a new Collegiate Institute to be erected in this city. The building is to be faced with gray sandstone and brick lined. Provision to be made for staff rooms, assembly hall, domestic science, manual training and storage, ventilation, mechanical draft and stack heaters, etc; automatically regulated steam heating; separate gymnasium in rear of building. Total cost $60,000, allowing $15,000 for gymnasium, heating, plumbing, ventilation and equipment. Further particulars may be obtained on application to J. W. Morgan, Port Arthur.

Quebec, Que.

Tenders addressed to the Hon. L. A. Taschereau, Minister of Public Works and Labor, P.Q., will be received at the Parliament Buildings, Quebec, until February 5th, for the completion of the new jail for the district of Montreal. Alphonse Gagnon is Secretary, Department of Public Works and Labor, Quebec, P.Q.

Runnymede, Ont.
Tenders will be received until February 10th for all trades in the erection of a school building at this place. Plans may be seen at the offices of W. A. Master, 26 Dundas street, West Toronto, and Ellis & Connery, architects, Manning Chambers, Toronto.

St. Thomas, Ont.
The establishment of a Normal School for nuns is under consideration in this city.

Stettler, Alta.
T. Clark King, architect, Lacombe, Alta., has prepared plans for the erection of an opera house and hall in this town for the Woodmen of America. Estimated cost $9,000.

Strathcona, Alta.
Tenders will be received by G. R. Ball until February 6th for the erection of a stable on the Salisbury school grounds.

St. Marys, Ont.
The ratepayers will be asked to vote on he by-law to raise $40,000 for the erec- ion of a modern school building.

Strathroy, Ont.
A special committee consisting of Mayor Pope, Messrs. Owens and Bowley, and two epresentatives from the Library Board, as been appointed to obtain plans for he proposed Carnegie Library.

St. Boniface, Man.
Tenders addressed to G. A. Rocan, Sec- etary-Treasurer of the School District, vill be received until February 11th for $22,000 five per cent. debentures issued or the purpose of completing the Pro- encher school and Tache school in this ity.

Toronto, Ont.
Among the improvements projected by he Park Commissioners for the current ear are the following:—Allen Gardens, alm house, $7,500. Riverdale Park, per- nanent shelter with lavatory accommoda- ion, $8,000; new lion house, $4,500; bird nd monkey house, $8,500. Alexandra Park, completing new shelter and lava- ories, $1,500. St. Andrew's Square, new helter building, lavatories, etc., $2,000. Queen's Park, new lavatories, $1,500; rus- ic shelters, $1,200.

Plans for the addition to the Home for ncurables, to be built with the $50,000 oted by the city, have been approved by he Provincial Secretary's Department. Ambrose Kent also hopes to build a urses' home on Close avenue, for which e is trying to raise $20,000.

Tenders will be taken at an early date or the erection of a new Transportation Building at the Exhibition grounds at an stimated cost of $86,000.

Dr. Sheard, the Medical Health Officer, s asking for $60,000 for the enlargement f the Isolation Hospital.

The Exhibition Directors have received plans for the construction of a new poul- ry building estimated to cost $26,000.

The City Architect notified the Board f Control last week that it would be a nonth before he could have the plans and pecifications for fixing up the assembly oom in the City Hall ready, and the con- ract for the work could not be let until pring.

The newly organized Ontario Liberal Club are securing options on site for the erection of a building. The provisional directors are G. T. Somers, J. H. Denton, P. C. Larkin, M. J. Haney, C. A. Moss, T. S. Hobbs, Dr. T. F. McMahon, G. Tower Ferguson, and J. F. M. Stewart.

Vancouver, B.C.
Tenders for the new school building to be erected at Grandview close February 8th with Mr. Murray, Secretary of the School Board.

Winnipeg, Man.
The Sanitorium trustees have decided to erect the provincial sanitorium at Ninette, on the C. N. R., Virden branch, between Hartney and Minto.

Wilkie, Sask.
Tenders will be received until February 15th, for the erection of a two-storey school building for the local School Board (J. H. Turnbull, Secretary-Treasurer). Estimated cost, $6,000. The building will be of frame construction, with stone foundation, shingle roof, fir interior finish. W. W. Chance, architect, Saskatoon, Sask.

AWARDED.

Lethbridge, Alta.
$30,000 bonds of this city, issued for the construction of a new wing to the hospital, have been awarded to Wood, Gundy & Company, Toronto.

Lindsay, Ont.
The Thornton-Smith Company of Toronto have obtained a contract for the interior decoration of St. Mary's Church, recently damaged by fire.

St. Hyacinthe, Que.
Maurice Perrault, architect, 15 St. Lawrence Boulevard, Montreal, has awarded the contract for the erection of a Catholic seminary at this place, to Andre Bonin, St. Hyacinthe. The building will be of fireproof terra cotta construction, and will cost $200,000.

St. John, N.B.
Sheron & Company, Montreal, have obtained the contract, at $2,250, for the installation of fireproof stairways in the general hospital.

Residences

Cartwright, Man.
The residence owned by M. Macklem was destroyed by fire last week at a loss of $3,500.

Lacombe, Alta.
T. Clark King, architect, is preparing plans for a brick veneered house to cost $2,500.

Toronto, Ont.
Mr. Glyn Osler has purchased a site on Scarth road for the erection of a residence.

Building sites have been purchased on Rowanwood avenue by Mr. Stanton, manager of the R. S. Williams Company, Mr. Bonisteel and Mr. Young, each of whom propose to erect residences in the near future.

Recent building permits include: Thomas Henry, 2 storey and attic brick dwelling, Clinton street, $2,200; Geo. Nicholson, 3 pair semi-detached and 1 detached 2 storey roughcast dwellings, brick fronts, Galt avenue, $9,000; H. H. Halls, 2 1-2 storey brick dwelling, Park place, $5,500; Phippen Bros., pair semi-detached 2 storey brick veneer dwellings, Wolfrey avenue, $2,600; D. T. Symons, K.C., 2 1-2 storey brick dwelling, Clarendon avenue and Warren road, $11,000; Frank Oliver, 2 1-2 storey brick dwelling, Avenue road, $3,500; W. A. Nixon, pair semi-detached 2 storey brick dwellings, near Bloor on 490-492 St. Clarens avenue, $4,000; F. J. Male, 2 1-2 storey brick dwelling, Thorold avenue, $3,000; F. Phillips, 2 detached 2 1-2 storey brick dwellings, Galley avenue, $5,600; Wm. H. Howard, 3 pairs semi-detached 2 storey roughcast dwellings, Pape avenue, $8,000; J. S. Case, 2 detached 2 1-2 storey brick dwelling, Geoffrey street, $7,000; J. M. Walker, 2 storey brick dwelling, Sunnyside avenue, $2,000; Jas. Gilchrist, 2 storey brick dwelling, Alhambra avenue, $2,500; Farrell and McCarthy, 3 attached 2 storey roughcast dwellings, brick fronts, Ossington avenue, $3,800; Dr. Capon, alterations to dental offices, College street, $1,500.

Vancouver, B.C.
J. J. Banfield has obtained a permit for the erection of a three-storey apartment block corner of Bute and Melville streets. Estimated cost, $22,000.

Plans have been submitted for the erection of a three-storey apartment block at the corner of Cordova and Abott streets.

Winnipeg, Man.
D. W. Bellhouse is preparing plans for an $8,000 residence of red pressed brick to be erected on Amherst avenue, Crescentwood, for O. L. Robinson. Estimated cost $8,000.

Plans are being prepared for additions to the residence of Walter Moss, Rosyln road, to cost $6,500.

George F. Robertson is having plans prepared for the erection of an $8,000 residence on Harvard avenue.

Business Buildings and Industrial Plants

Blenheim, Ont.
The Pere Marquette Company's large coal chute at this place was destroyed by fire last week at an approximate loss of $8,000.

Cumberland, B.C.
The premises of Campbell Bros., Grant & Mounce and others were destroyed by fire last week at a total estimated loss of $50,000.

East Angus, Que.
A new pulp mill will be erected in the spring at a cost of $250,000.

Emerson, Man.
The Alexandria Block was destroyed by fire last week at heavy loss.

Halifax, N.S.
Among the buildings contemplated for erection this season are a large hotel building, a new factory for the Anderson Furniture Company, a large boat house on the Arm, near the end of Jubilee road, and a new hotel building at Bedford.

The Board of Trade are considering a proposition for the establishment of a large cold storage warehouse in Halifax.

Kingston, Ont.
E. R. Beckwith, consulting engineer and architect, is preparing plans for the erection of a large hotel. Estimated cost $150,000. The principal materials will be reinforced concrete, concrete blocks and terra cotta hollow tiles.

Leamington, Ont.
J. M. Henry will erect a two-storey theatre and two store buildings this spring.

Lachine, Que.

A company of New York capitalists are negotiating with the local council for the erection of a large paper factory. If matters are arranged, work on the building will be commenced this spring.

Lethbridge, Alta.

Architect MacDonald is now preparing plans for a two storey business block 50 by 90, for Bowman & Johnstone, to be erected on Redpath street.

Architect Dodd is preparing plans for a three-storey steel and reinforced concrete block 50 by 125, to be erected on Redpath street in the spring for R. E. Sherlock.

The Bank of Commerce recently bought two lots on Round street for $24,000, and will erect a fine bank building this year.

London, Ont.

It is definitely stated that the Globe Casket Works, recently destroyed by fire, will be rebuilt here.

Milton, Ont.

P. H. Finney, architect, 43 Victoria street, Toronto, has prepared plans for a $25,000 factory to be erected here for the C. R. Willmott Company.

Montreal, Que.

Chas. Bernier, architect, this city, has prepared plans for a factory to be erected for the Campbell Clothing Company.

The Comet Motor Company's large building on Jurors street was destroyed by fire last week.

The biscuit factory owned by G. N. Pichet, corner of Ontario and Jeanne d'Arc streets, was destroyed by fire last week at an estimated cost of $10,000.

Moosomin, Sask.

The livery stable owned by S. Jennings, of Nokomis, was recently destroyed by fire.

Sault Ste. Marie, Ont.

According to the terms of an agreement practically arrived at last week, between the city and Mr. John O'Boyle, representing a company of capitalists, arrangements were made for the construction of a dry dock and ship-building yards, work to commence with the opening of spring. The company asks the city for exemption from taxation and a cash bonus annually for twenty years, and in return promises to construct a ship-building plant and dry dock, initial expense to be $500,000. A committee, consisting of members of the Board of Trade and Council was appointed to look into the matter and make a report at a public meeting to be held at once.

Sherbrooke, Que.

C. E. White, architect, has prepared plans for the erection of a six-storey warehouse for the Mitchell Hardware Company.

Summerland, B.C.

A company is being organized by local fruit growers for the purpose of erecting a canning factory. The capital of the new concern is $30,000.

St. John's, Nfd.

Butler & McDonald, architects, have prepared plans for the erection of three warehouses and the rebuilding of a three-storey building on Water street.

Toronto, Ont.

Henry Disston & Sons, saw manufacturers, 112 Adelaide street east, have purchased a site on Fraser avenue and will shortly commence the construction of two factory buildings.

The Imperial Storage Company have obtained a permit for a four-storey and basement warehouse on Clinton street at a cost of $20,000.

R. R. Barbor, architect, has prepared plans for a two-storey brick factory to be erected at 782 King street west, near Major street, for M. P. Warren, 90 York street. Estimated cost, $5,000. The owner will purchase all necessary materials, and erect the building by day work.

The Toronto Show Case Company are preparing plans for the erection of a large factory on Carlaw avenue.

The Toronto Street Railway Company will erect large car barns this spring on Lansdowne avenue. They will be of concrete and brick construction.

John O'Neill has obtained a permit for alteratons to stores and dwellings at 326-328 Queen street east, to cost $4,500.

A modern business block will probably be erected in the near future on the southeast corner of Yonge and Dundonald streets.

It is stated that the northeast corner of Yonge and Agnes streets has been purchased by Robins, Limited, for parties who contemplate the erection of a large business block.

Victoria, B.C.

The newly organized Western Canada Wood Pulp & Paper Company, Limited, will erect a large pulp and paper plant at Quatsino Sound. Mr. G. Kolts may be addressed.

Vancouver, B.C.

A site has been secured on the north shore of False street by Seattle and Kansas capitalists for the erection of a large elevator.

A syndicate has been formed for the construction of a large lumber mill on Esquimault Harbor. A site has been secured and it is believed that allied with this scheme is a project for the construction of a railway from the Straits to Barkley Sound. It is proposed to construct on the site indicated a number of large buildings and to install under their cover a milling plant having as great a capacity as any in the west, being complete and modern in every detail, and costing about $200,000.

The Empress Manufacturing Company have taken out a permit for the erection of a factory to cost $20,000.

H. Hutchings will build a frame store and dwelling on Harris street at a cost of $2,000.

Woodstock, Ont.

Construction will shortly commence upon the erection of a large new factory for the Oxford Knitting Company, Limited. The main building will be 200 feet long and 56 feet wide, of brick construction and two storeys high. A dye house will also be built, 70 feet by 30 feet.

Winnipeg, Man.

It is stated that the O'Connor hotel on Main street south has been sold to T. D. Farmer, of Hamilton, Ont., who will erect a seven-storey block on the site.

Among the structures which will be erected this season are an office building on Lombard street for the Great West Life Company, an office building on Garry street for the Canada Permanent Loan & Mortgage Corporation, a bank building for the Eastern Townships Bank and one for the Royal Bank, two large hotels, new G. N. R. terminals, new C. P. R. sub-station, etc.

Work will be started in a month upon the construction of the new Royal Bank Building to be erected on the site of the old Imperial Dry Goods store. The contract will be awarded shortly.

A 12-storey modern office building will be erected by J. D. McArthur on Portage avenue.

Windsor, Ont.

The Reo Motor Car Company, of Lansing, Mich., have decided to locate their Canadian branch plant in this city, with W. G. Morley as manager.

The Postum Cereal Company, Battle Creek, Mich., will erect a factory to cost $50,000 at this place this spring.

AWARDED.

Montreal, Que.

Mitchell & Creighton, architects, Inglis Building, have awarded to J. A. Major, St. Henri, the contract for the construction of a moving picture theatre for the Idealograph Company at 1691 Notre Dame street west.

Power Plants, Electricity and Telephones

Belleville, Ont.

At a recent meeting of the city council a proposition was made from a prominent firm of New York capitalists proposing the establishment of a city and suburban line, extending from Belleville to Trenton, through Trenton to Prince Edward County, from that county to this city, from here to Shannonville, passing the two big cement works, from there, through Thurlow into Corbyville, through Corbyville to this city. Assistance will be asked from the city, and the company promises to spend $800,000. The matter is in abeyance.

Calgary, Alberta.

Tenders will also be received until February 18th by H. E. Gillis, City Clerk, for the supply to the city of one 500 kw. generator, connected to a 750 h.p. high speed engine for railway system, with condensor, switchboard, etc.; also for 3 water tube boilers, equivalent to 1,000 h.p., with piping and induced draft system for 2,500 h.p. Plans and specifications at office of City Engineer.

Tenders addressed to H. E. Gillis, City Clerk, will be received until February 18th for supplying to the city the following street railway material: 397 long tons No. 80 A.S.C.E. steel rails; 746 long tons No. 60 A.S.C.E. steel rails; together with certain special work, also spikes, bonds, tie plates. Also angle irons, track bolts, ties, etc., 12 standard street railway cars, one street railway sprinkler, and one street railway sweeper. Overhead construction—Steel span wire poles, 30 feet and 35 feet, three sections; cedar poles, 12.5 miles of 2.0 trolley wire, 10.2 miles of 3.0 feed wire, span wire, hangers, insulators and conical strain insulators, ears, cross-overs and trolley frogs. Bids will be received upon the entire schedule or any item of the same. Specifications may be obtained at the office of the City Engineer.

Edmonton, Alta.

A five-mile extension will be built to the street railway during the present season.

Kingston, Ont.

The franchise of the Bell Telephone Company will expire on July 1st, and its renewal will be a matter for the City Council to consider. The franchise was granted in 1904, and the Telephone Company pays the city $580 a year, and gives a certain number of free phones for the city buildings. The telephone system has increased greatly in Kingston during the past few years, and there are now about nine hundred phones in use. The company has not yet decided upon extending its underground system, which it began several years ago, but it will continue it before any permanent pavements are laid in the business section.

Kentville, N.S.
The Kentville Electric Light & Power Company will install another small generator in their lighting plant in the near future.

Liverpool, N.S.
The Town Council are considering the addition of another generator to their lighting plant. Mr. A. H. Drew, Deputy Town Clerk, has charge of the electric plant.

Morewood, Ont.
C. M. Willard states that the Morrisburg Electric Railway has plans under consideration for beginning construction on its projected line this spring. The majority of the right of way has been secured. The road will be standard gage, 70 miles in length and will extend from Morrisburg to Ottawa, through the following cities:—Williamsburg, Winchester, Chesterville, Morewood, Orwan, Kenmore and Metcalf. The overhead trolley system will be installed on the line. The power plant and repair shops will be erected in Morrisburg. Headquarters, Box 45 Morewood. Capital stock, authorized, $1,000,000; issued, $200,000. Bonds, authorized, $800,000. Officers: C. M. Willard, president and general manager; W. M. Louchridge, vice-president; Bradford Louchridge, secretary; J. H. Louchridge, treasurer, all of Morewood; Robert Merkley, Williamsburg, superintendent; G. Brown, Morrisburg, chief engineer.

Toronto, Ont.
Mr. K. L. Aitken, the City Electrical Engineer, states that he is about ready to take tenders for the work on the municipal distributing plant. Plans have been prepared and surveys made.

A deputation from the Ottawa district waited upon the Hydro-Electric Commission to urge the erection of storage dams on the Mississippi river. It was pointed out that the generation of electrical energy by this means would be very cheap and beneficial to Carleton Place, Almonte, Blakeney, Pakenham, Appleby, and Galeta, as well as to private industries. Consideration was promised.

Victoria, B.C.
The City Electrician in his annual report recommends the extension of the city's electric light plant by the addition of equipment having capacity for at least five hundred lights. He also recommends that a suitable building for store purposes be erected at the lighting station.

Windsor, Ont.
George Bouteiller, Walkerville, Ont., is authority for the statement that the Windsor Tunnel & Lake Erie Company expects to begin construction about July on its proposed railway, which is to connect Windsor, Sandwich, West Vereker, New Canaan, McGregor, Huron and Oxley. From 26 to 30 miles of standard gage single track will be built. At the present time the company is at work securing franchises and will shortly apply for a charter. Officers: R. A. Bailey, Detroit, Mich., president; Dr. J. A. Smith, Windsor, vice-president; J. G. Leggatt, Laing Block, Windsor; Walter Boug, Windsor, treasurer.

Winnipeg, Man.
Mr. Wm. Whyte, second vice-president of the C. P. R., when recently in this city stated that the company would shortly commence electrifying that portion of the system in southern British Columbia and eventually all of its lines in the west.

AWARDED.

Campbellford, Ont.
The Ontario Securities Company have been awarded $50,000 bonds of this town, issued for the completion of the hydro-electric plant.

Edmonton, Alta.
The contract for an 1,800 horse power steam engine at a cost of $27,800 f. o. b. Edmonton, has been awarded to Goldie & McCulloch, Galt, Ont. The new engine is designed to operate a 1,000 kilowatt alternator which was purchased from the Canadian General Electric Company for $14,300. Tenders were submitted for both gas engines and steam engines, but acting upon Commissioner McNaughton's report the Council unanimously decided in favor of the steam plant. According to the Commissioner's report the cost of a steam plant, together with all auxiliaries, would be $74,350, while a gas producer plant of the same capacity would cost over twice that amount.

Miscellaneous

Hamilton, Ont.
Tenders close February 3rd with S. H. Kent, City Clerk, for supplying the Waterwork Department with cast iron pipe, special and ordinary castings, hydrants and valves and leather valves, service brass work, pig lead, lead pipe, stopcock boxes and sundry hardware.

Fort William, Ont.
Tenders addressed to William Phillips, Treasurer, will be received until February 22nd for $329,000 debentures issued for various purposes, also for approximately $156,500 local improvement debentures.

Liscomb, N.S.
Tenders addressed to G. J. Desbarats, Acting Deputy Minister of Marine and Fisheries, Ottawa, will be received until March 1st for the construction of a wooden lighthouse tower on Redman Head. Plans and specifications may be obtained at the Department at Ottawa, at the Agency of the Department at Halifax, and at the local post office.

Panmure Island, P.E.I.
Tenders addressed to G. J. Desbarats, Acting Deputy Minister of Marine and Fisheries, Ottawa, Ont., will be received until February 19th for the construction of a wooden dwelling for the Engineer of the Fog Alarm. Plans and specifications may be seen at the Department at Ottawa, at the Agencies of the Department at Charlottetown, and Pictou, and at the post offices at Georgetown, Summerside and Souris East.

Portage la Prairie, Man.
At a recent meeting of the Parks Board two new tenders for the erection of a needle dam were read, one from William Carr, of this city, for $14,000, and one from the Carter-Halls-Aldinger Company, of Winnipeg.

Watford, Ont.
$5,370 bonds of this village, issued for local improvements, have been awarded to Wood, Gundy & Company, Toronto.

Winnipeg, Man.
Tenders addressed to the Chairman of the Board of Control for supply of 120 feet of 26-inch 8-ply rubber elevator belting delivered at the City Quarry, Stony Mountain, will be received until February 11th. M. Peterson is Secretary, Board of Control.

Tenders addressed to the Chairman of the Board of Control will be received until February 8th for the following supplies for the Street Commissioner's Department: 250 asphalt scrapers; 250 16-inch brass brooms; 200 hoes, blades five inch by fourteen inch; 4 dump waggon boxes, 4 yard capacity; 600 feet 1 1-2 inch rubber hose. Specifications may be obtained at the office of the Street Commissioner.

AWARDED.

Ottawa, Ont.
The Ontario Securities Company, Limited, were the successful tenderers for $966,940.90 four per cent. debentures of this city.

Welland, Ont.
M. Beatty & Sons have received from the Dominion Dredging Company an order for a large dredge, 42 feet wide, 120 feet long, and 11 feet deep.

NEW COMPANIES.

Martin Pump & Machine Company, Limited, Toronto, Ont., incorporated, capital $40,000. Incorporators, T. H. Martin, J. Martin, G. C. Valens and others, all of Toronto.

Newfoundland Marble Company, Limited, Toronto, Ont., incorporated, capital $100,000. Incorporators, D. T. McIntosh, A. Dods, G. Grant, A. N. Morine and F. Grundy, all of Toronto.

Frankford Cooperage Company, Limited, Frankford, Ont., incorporated, capital $40,000. Incorporators, G. B. Mott and E. J. Mott, both of Frankford, Ont.; G. A. Graham, H. W. Ackerman and W. S. Morden, all of Belleville, Ont.

Trenton Cooperage Company, Limited, Toronto, Ont., incorporated, capital $40,000. Incorporators, E. R. Lynch, J. D. Montgomery, both of Toronto, and others.

Ontario Metal Culvert Company, Limited, Guelph, Ont., incorporated, capital $55,000. Incorporators, R. W. Gladstone and D. Gladstone, of Guelph, Ont.; H. B. and A. L. Sharman, Russell, Man., and others.

Canadian National Carbon Company, Limited, Toronto, Ont., incorporated, capital $40,000. Incorporators, R. .W Hart, O. H. King, of Toronto, and others.

Hamilton Bridge Works Company, Limited, Hamilton, Ont., incorporated, capital $1,000,000. Incorporators, Hon. J. S. Hendrie and W. B. Champ, all of Hamilton; G. M. Hendrie, Windsor, Ont., and A. D. Braithwaite, Toronto, Ont.

Empire Light Company, Limited, Montreal, Que., incorporated, capital $75,000. Incorporators, L. H. Packard, J. G. Watson and H. A. Barnard, all of Westmount, Que., and R. Munro and G. W. Birks, both of Montreal.

Canadian Turpentine, Limited, Montreal, Que., incorporated as manufacturers of chemicals, and to carry on any business connected with wood distillation, capital $100,000. Incorporators, R. Munro, J. B. Picken, J. T. Donald, N. Holland and R. H. Benn, all of Montreal, Que.

Tenders and For Sale Department

Notice to Contractors

The Alvinston School Board contemplates installing either a

Hot Water or Steam System of Heating

for the use of the Alvinston School. Tenderers will please send plans and specifications when tendering. Board meets the first Friday of every month.

ALEX. M. PHAIL,
Secretary School Board,
Alvinston, Ont.

6

City of Saskatoon

Province of Saskatchewan

Tender for

Pumping Machinery

Sealed tenders will be received by the City Clerk until

8 p. m. on February 24th, 1909

for furnishing and erecting one Pumping Engine with a capacity of 1,200 to 1,500 U.S. gallons per minute.

For further particulars address the Chief Engineer

WM. HOPKINS, Esq.,
Mayor,
Saskatoon, Sask.

J. H. TRUSDALE, Esq.,
Secretary-Treasurer,
Saskatoon, Sask.

WILLIS CHIPMAN, C.E., Chief Engineer,
103 Bay Street, Toronto, Ont. 5

City of Lethbridge, Alberta, Canada

Tenders for

Municipal Power Plant

Specifications, drawings and form of tender may be obtained from the Secretary-Treasurer, City of Lethbridge, Alberta, on and after the FIFTEENTH DAY OF JANUARY, 1909. The following are the sections ssued:

- A. Boilers and Accessories.
- B. Economizer.
- C. Feed Pumps.
- D. Mechanical Draft.
- E. Pipe Work and Valves.
- F. Steam Turbine Generator.
- G. Steam Engine Generator.
- H. Re-erection of Steam Engine.
- I. Condensing Sets.
- J. Crane.
- K. Switchboards, &c.
- L. Motor Generators and Transformers.
- M. Buildings, Steel Work, Etc.

Tenders on any or all of the above sections or any combination of the above sections will be received.

Tenders to be enclosed in a sealed envelope addressed "Tenders for Electric Plant" and to be delivered to the undersigned at the City Hall, Lethbridge, on or before the 1st DAY OF MARCH, 1909, and to remain open for acceptance for two (2) calendar months from that date.

Each tender must be accompanied by a certified cheque payable to the Secretary-Treasurer, of the City of Lethbridge, for 10°/₀ (ten per cent.) of the amount of the tender, which will be returned to the tenderer, unless he fail to enter into contract for the work at the rate stated in the tender.

Plans and specifications may also be seen at the offices of Messrs. Smith, Kerry & Chace, Confederation Life Building, Toronto, Ontario, and the Carnegie Public Library Building, Winnipeg, Manitoba. The lowest or any tender not necessarily accepted.

A deposit of $10. (ten dollars) will be required for use of plans and specifications, which will be returned upon letting of contracts.

GEO. W. ROBINSON. 7

City of Calgary

Tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned, marked "Tender for Boiler and Generator," until the 18th DAY OF FEBRUARY, NEXT, at 12 o'clock noon, for supplying to the City the following:

3 Water Tube Boilers equivalent to 1,000 H.P., with piping and induced draft system for 2,500 H.P.

Also 1 500 K.W. Generator connected to a 750 H.P. High Speed Engine for Railway System, with condensor, switchboard, etc.

A certified check on a chartered bank in Canada for 2½ per cent. of the amount must accompany each tender—Separate offers may be made for any of the items set out herein,

Plans and specifications can be had on application to the City Engineer, Calgary, Alta.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary, January 20th, 1909. 7

City of Brantford

Sewer Construction

Sealed tenders addressed to John Moffat, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock noon on

Thursday, February 11th, 1909,

or the furnishing and laying of about 2,250 feet of 12 inch extra strength Sewer Pipe and 635 feet of 12 inch Cast Iron Pipe, together with 11 manholes; greatest cut 32 feet; average cut 17½ feet.

Plans and specifications may be seen and instructions to bidders, and forms of tender obtained at the City Engineer's Office.

Each tender must be accompanied by a marked cheque for 5 per cent of the amount of the tender.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.

City Engineer's Office,
Brantford, January 18th, 1909. 5

City of Calgary

Tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned marked "Tender for Street Railway Material," until the 18th DAY OF FEBRUARY NEXT, 12 o'clock noon, for supplying to the City the following:

Covering approximately:

397 long tons No. 80 A. S. C. E. steel rails
746 " No. 60 " "
Together with certain special work, also spikes, bonds, tie plates.
Angle irons, track bolts, ties, etc.
12 standard street railway cars.
One street railway sprinkler.
" " " sweeper.

OVERHEAD CONSTRUCTION.

Steel span wire poles 30′ and 35′ three sections.
Cedar poles.
12.5 miles of 2.0 trolley wire.
10.2 miles of 3.0 feed wire.
Span wire.
Hangers, insulators, and conical strain insulators.
Ears.
Cross-overs and trolley frogs.

Bids will be received upon the entire schedule or any item of the same. A marked cheque covering 5 per cent up to $10,000 and 2½ per cent over and above this sum of the amount bid will be required to accompany each and every tender.

Full particulars and specifications will be supplied at the City Engineer's Office.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary, January 20th, 1909. 7

Agent Wanted

or the best line of Concrete Machinery in the world. A splendid opportunity for an aggressive young firm or individual. Box 136, CONTRACT RECORD, Toronto. tf

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World's Largest Concrete Bridge.

As an example of the great size possible for concrete bridges, the concrete bridge over the Wissahickon Creek in Philadelphia may be mentioned. This bridge is the largest reinforced concrete bridge in the world and has attracted attention among prominent engineers throughout the country. It is 525 feet long and is 147 feet in height. The main arch is 233 feet long while the approach spans measure 53 feet each. It required more than two years to build this bridge, over 300 men being continuously employed. Over 19,000 cubic yards of concrete were used, weighing 40,000 tons. Before the concrete work was begun a false work bridge was constructed of 360,000 feet of timber and 130 tons of steel. The total cost of the bridge was over $260,000.

Inclined Grooves for Glass Roofs.

One way of getting around the difficulty caused by water collecting on the under surface of glass roofs is similar to that employed in forests and parks to prevent washing away of the hillside paths; namely, making inclined grooves towards the sides; only in this case the grooves are of horseshoe shape and form a series of parallel corrugations which carry the drops to the ribs which separate the plate; they then follow these without much difficulty down the slant to the trough below. This system may be employed either with glass sheets in which wire is embedded or with plain plates.

Women are largely employed in Prague and elsewhere in Bohemia as ordinary day laborers in the construction of buildings. They mix mortar. sift sand and carry bricks and mortar to various parts of the buildings being constructed. For such service they are paid from 32 to 37 cents per day. Women also unload coal, carrying it from the wagon on the street to the cellar of the building. For this they are paid 40 cents per day, and work from 6 a.m. to 6 p.m., with an hour for dinner.

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Further Analysis of an Important Question.

In the preceding issue of the "Contract Record" reference was made to Canada's need of technical schools. A few remarks in connection with the proposed institutions and with the movement which is being inaugurated in an endeavor to bring about their establishment, are therefore timely. While it must be admitted that the problem before the country is a great one, and one that in its solution has involved the expenditure of an incalculable amount of thought and money in various countries, Canada can undertake the work under favorable conditions and with the certainty of success, for she can use the results in other lands as stepping stones. The new movement is designed to bring together two forms of technical education which, for generations in some places, have been carried on as two distinct and relative systems of training—education by apprenticeship and education by schools. From these, it is hoped, will be evolved something entirely new in this department, a form of education which shall produce in equal proportions manual skill and mental intelligence.

Until now the argument has concerned itself with two phases of the apprentice system—one a definite and complete system, which may or may not be substituted for a trade school; the other an indefinite and incomplete system, which lacks the fulfiling of a mutual obligation, which is very essential to a properly constructed apprenticeship course. Another type of apprenticeship now in evistence is where the lad is indentured to one department only, there to specialize. This plan is popular because it enables the boy to receive higher wages and the employer to get more efficiency in a comparatively short time. As a rule, however, specialization limits the capacity and narrows the mind. It is right as it secures special skill, but there should be something more in order to train the all-round man. Let a man be an all-round specialist if this be possible, but do not confine him to one branch of a trade. The British mechanic, the genuine article, generally affords an example of the inestimable value of a sound general training. There is little excuse, in fact, for ignorance from this quarter. In England they have a good apprenticeship system and in all the large cities they have excellent technical institutions maintained by the government.

In many large American and European industrial establishments the question of the training of labor is the one which receives the most careful attention. Careful selection of boys fitted for the particular work is the first step. They must pass also a physical, mental and moral examination. Their rate of pay is determined beforehand and increased now and then for encouragement. The kind of work the boys do is varied, and their future is considered as well as the profits to be derived from their service. In brief, it is a shop course of study, much as any industrial school might be expected to have. Academic work to supplement the work in the shop is arranged for by nearly all the best concerns, generally imparted by one of the engineering staff. In the case of advanced apprenticeships the boys are paid for their time. This is an essential feature of the modern apprenticeship system. The boys are encouraged to attend evening classes or take correspondence lessons, but investigation shows that this encouragement lacks definite results. The cause of this is the lack of interest shown by employers in following up the results of this encouragement.

Any movement towards the establishment of trade schools generally meets with opposition from the trade unions, but here in Canada we shall have to contend with no very deep-seated prejudice. In the cases where there are union regulations in regard to apprenticeship they are often disregarded wholly or in part by both unionists and their employers, both of whom must realize that the effectual expansion of the system, with an increase of skill, and consequently of wages, must prove to their mutual advantage.

Some interesting observations in connection with this subject were recently delivered in Montreal before the convention of the Canadian National Association of Builders, by Mr. Wm. Tytler, executive officer for the association at London, Ont., whose paper will appear in the next issue of the "Contract Record."

Plenty of Optimism in the West.

"The Commercial" takes the following optimistic view of the Winnipeg building outlook for 1909:

"We have on several occasions predicted a lively building season for this year, and January so far appears to back us up in our forecast. Investors and business concerns are planning to erect many buildings this year suitable to the parts in which they are doing business. There are already plans in the offices of Winnipeg architects for buildings to the value of $2,000,000, and these are sure of going ahead as soon as warm weather opens up. There is a still greater value in buildings now under way which will be brought to completion during the year, and those interested and closest in touch with the situation predict the biggest year in building yet seen in Winnipeg. There will also be an improvement in the quality of the dwelling-houses erected.

"One good authority gives the following reasons why 1909 should be a banner building year. Building materials are selling at satisfactory prices, there being practically no change in anything outside of a lessening in the discount on lumber. There is considerable lumber on hand, and the winter cut has been quite large. The labor situation, though always uncertain till May 1st, looks good, and there is a prospect of the building trades meeting the builders in a determination to keep things moving. The money market has decidedly improved in the last year. There is still more room for a decrease in the cost of money, however, and one man suggested that if it could be secured for 5½ per cent. on large propositions there would be no doubt of a great investment in buildings this year. All concerns that deal with humanity in a temperate clime, especially where agriculture is paramount, have decided that the prairie is marching towards first place on the continent."

Civil Engineers' Convention.

The annual convention of the Canadian Society of Civil Engineers was held at the King Edward Hotel on Thursday, Friday and Saturday of last week. The attendance was very large and many extremely interesting matters were dealt with. The president, Dean Galbraith, of the Faculty of Applied Science of the University of Toronto, presided at all the meetings. On Friday a great number of the members enjoyed a special trip to Hamilton, Port Colborne and Welland for the purpose of inspecting the works of the Canadian Westinghouse Company, the Canadian Portland Cement Company, the International Harvester Company, and the elevators at Port Colborne. On Friday evening a banquet was held at the King Edward Hotel. Thursday and Saturday were given over largely to business; on Thursday evening, however, a splendid banquet was given at Convocation Hall of the University of Toronto. The occasion was the twentieth annual dinner of the Faculty of Applied Science, and over eight hundred were present. A number of interesting after-dinner speeches were delivered and one of the most interesting events of the evening was the presentation of a magnificent service to Dean Galbraith. Mr. A. L. Morris, the first graduate of the School of Practical Science, made the presentation. Another interesting event was the presentation of a handsome gold watch and chain to Dr. W. H. Ellis, professor of chemistry. Dean Galbraith and Dr. Ellis commenced teaching together thirty years ago in the School of Practical Science and have been associated with it ever since.

The election of officers which took place on Saturday afternoon resulted as follows: President, Geo. A. Mountain, Chief Engineer of the Railway Committee of Canada; Vice-Presidents, Messrs. W. F. Tye, Montreal; Col. H. N. Ruttan, Winnipeg, and G. J. Desbarats, Sorel, Que.; Council, Messrs. J. E. Schwitzer, Winnipeg; A. E. Doucet, Quebec; D. MacPherson, Ottawa; D. A. Ross, Winnipeg; N. J. Kerr, Ottawa; R. S. Lea, Montreal; J. G. Legrand, Montreal; F. W. W. Doane, Halifax; C. L. Cantlee, Montreal; L. A. Vallee, Quebec, and F. P. Gautelius, Montreal; Members of General Section, Messrs. F. P. Shearwood, Montreal, and A. St. Laurent, Ottawa; Electrical Section, Messrs. C. H. Mitchell, Toronto, and L. A. Herdt, Montreal; Mechanical Section, Messrs. H. T. Bayfield, Vancouver, and W. Kennedy, Jr., Montreal; Mining Section, Messrs. F. L. Wanklyn, Montreal; Charles Fergie, Sydney, B.C., and R. W. Leonard, St. Catharines.

According to the United States Trade and Commerce reports the imports of cement from British North America for nine months ending with September, 1908. were valued at $18,687, against $1,968 for the same period in 1907, and $18,408 in 1906. During September, 1908, the value was $13,603, and in 1907 only $189

London Builders' Exchange Meeting.

The eleventh annual meeting of the London, Ont., Builders' Exchange was held on Jan. 18th. The liveliest interest was taken in the institution during the past year and this interest was reflected by the satisfactory conditions disclosed at the meeting. All the officers were re-elected as follows: President, Mr. John Whittaker; Vice-President, Mr. George Hyatt; 2nd Vice-President, Mr. George Everitt; Secretary-Treasurer, Mr. George S. Gould. Messrs. J. Jones, George C. Young, Arthur Nobbs, W. Nutkins and G. H. Belton were elected a board of directors. Messrs. John Whittaker, vice-president of Ontario, and William Tytler, executive officer for London, were appointed to represent the local exchange in the Canadian National Association of Builders. Allusion to several interesting points was made in the address of the president, whose remarks were in part as follows:

"A very large proportion of the unsatisfactory business conditions that have prevailed for the last eighteen months have passed away, and from now on we can look forward to a season of renewed prosperity, and stand prepared to take advantage of all its openings in the way of building construction. And right here it might be said that a live Builders' Exchange presents a contractor with more safeguards for conducting an honest business than can be derived from any other source, and when all reliable contractors will realize this, and take advantage of its benefits, they will not only better their own condition but better the community at large. As you are aware, the Canadian National Association of Builders is now properly organized and is taking an active interest in all questions bearing on the relation of the employer to labor, such as unfair legislation, the open shop, technical schools, etc. Some contractors are disposed to challenge the necessity of a national association at present, and think its usefulness not commensurate with its expense, but at the front of that association you have those who are guarding our interests with zealous care, and who not only check the advance of labor agitators, but who advance boldly into their strongholds and wrest from them some of their long-exercised holds upon our employees. It is to be regretted that the contractors of our smaller cities and towns are apparently indifferent to the benefits to be derived by organization, and we are of the opinion that a good organizer could be actively employed for two or three months very profitably. In our last report reference was made to the great need we had in this city of an up-to-date building by-law and the appointment of a building inspector to carefully consider all plans and specifications before issuing a permit to proceed; and also to watch buildings in the course of construction to see that the by-law is complied with. Since then a by-law has been adopted by the City Council, and it should be part of our duty to see that it is strictly enforced.

"The conditions of the labor market have been fairly satisfactory during the past year. In some trades wages have been higher than the conditions warrant, and upon the termination of any existing treaties they should be readjusted. Another matter that should be adjusted by the exchange is the time of starting and terminating the day's work so as to have uniformity amongst all building trades. Our members have ben virtually free from persecution under the 'Employers' Liability Act' during the year. Only one action was taken against an exchange member, and in that the contractor was proven not liable. During the year we have lost two members through business troubles, but we have added ten new names on our roll, and before the close of this year we are confident that by a little exertion on the part of each of us our membership roll will be increased by 25 new names. It will be the duty of the new board to be on the lookout for a different home, as these premises will have to be vacated on account of reconstruction, and in selecting new quarters, provision should be made for considerable expansion, and also for a permanent exhibition of all building supplies.

"In conclusion, we would again urge you to take still deeper interest in exchange principles. If you are a contractor, see that the firms supplying your materials are members in good standing in the exchange; and if you are a supply dealer, be very careful about opening an account with a contractor who has no use for an exchange. If you have a sub-contract to let, give your exchange members the preference over those who, while participating in the benefits the exchange has procured for all contractors, continue to cry it down."

The Value of a Cost System

By W. E. Trout

The following remarks are a synopsis of a paper upon "The Value of a Cost System," read by Mr. W. E. Trout, of Business Systems, Toronto, at the seventh annual convention of the Manufacturers of Clay Products held recently at Brantford:

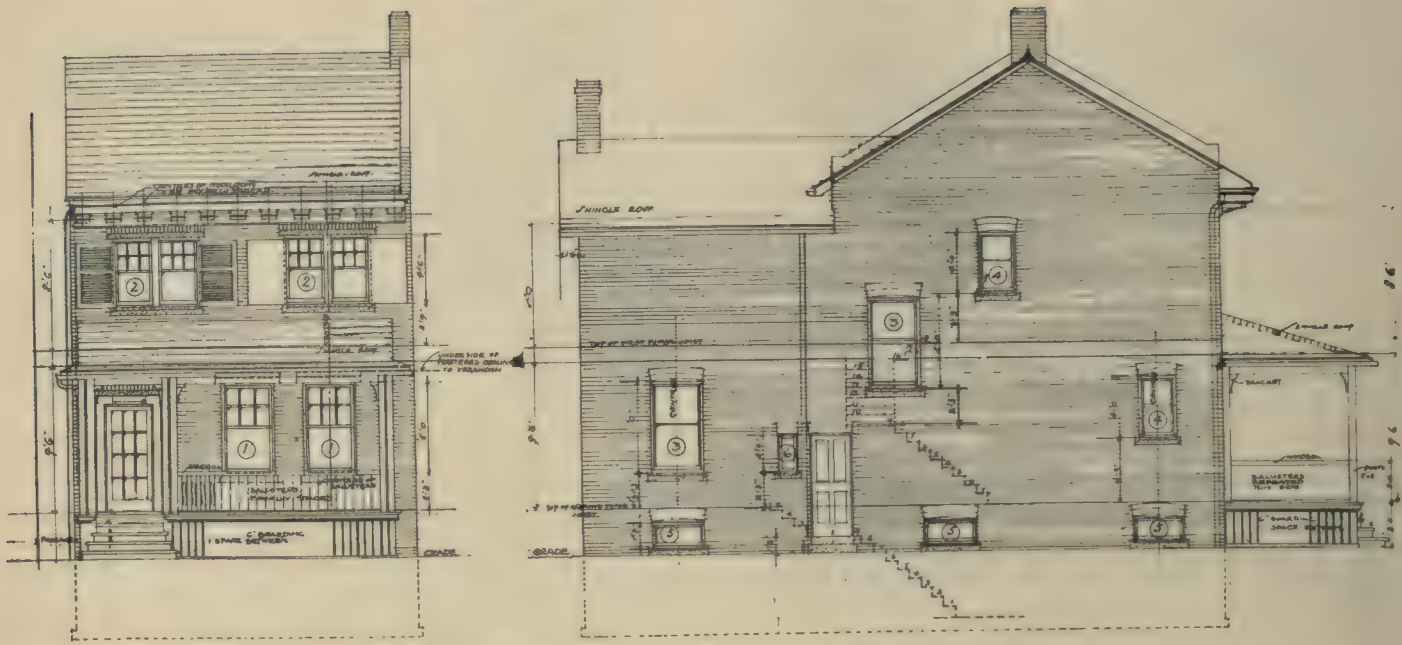
There are always three essential things to consider in arriving at manufacturing costs. The first is labor, the second is material, and the third is general or overhead expenses. Labor is comparatively easy to ascertain showing the amount of work accomplished. Cost of material must be ascertained in two ways, one by keeping track of the amount of material that goes into the job, and the other by finding the average cost of material which cannot be separated from each particular job or operation, by finding the average cost of such material. General or overhead expenses can be arrived at from your books by adding together rent, light, heat, power, taxes, insurance and such labor as is general and not specific to any one operation, and then taking your manufacturing labor for the same length of time and finding what percentage the general expenses bear to your labor. We must draw certain fixed lines dividing the operations in such classifications as are practical. This seems to be an easy matter in your business. (1) The getting out material; (2) Preparing material; (3) Wheeling and setting kilns; (4) Wheeling, sorting and loading, or in more concise terms: 1, Pit; 2, press; 3, kiln; 4, delivery. Now that we have the work classified we must have the men. I believe that the most practical way of keeping track of the men is the use of the clock, every man having a card that is numbered on the back. As he passes in through the superintendent's office he takes this card from a cabinet, places it in a slot, and presses a lever which stamps the exact minute. He then places it in a cabinet on the other side of the clock in a pocket carrying numbers to agree with cards, and in passing out takes his card and makes the same operation, carrying the card back to the first cabinet. In this way it is a very simple thing to make up the week's pay, carrying only the full amount to the pay sheet, which is divided into four departments, adding a column for premium work if necessary.

The next step I would take would be to divide the men in gangs to correspond with the machines or presses. If you have six machines, you would require six gangs. This is necessary to get the best results from the men. Put them on their nerve and, if necessary, give to every man in each gang a certain premium for all brick put into the kiln each day over and above a certain number There are a number of things that are necessary in commencing a cost system that can easily be eliminated, say after two years' running. For instance, there is information in department 1, pit, that is necessary in order to make comparisons and to get the various operations down to the finest point, but later some of this detail can be dropped with safety, afterwards using the average, when the variation is very small. The most important operations are—stripping, derrick, dynamite, drilling and general pit work. By having gangs, as suggested, you are able here to get comparisons that are really valuable in assisting you to get the proper men for this department, as the number of loads sent to the machine can easily be arrived at for each gang. Of course, it will be necessary for the man to make out a time sheet each day showing his number—Gang No., class of work, hours, rate and amount. The rate and amount being filled in by the cost clerk in all cases. Dept. 2, machine or press. This time sheet would shown kiln number, number of employee, gang number, pan number, screen number, and press number, hours, rate and amount. Dept. 3. This sheet would show employee's name and number, gang number, kiln number, class of work, kind of brick, number of hours, quantity, rate per hour, rate per thousand and amount. The operations will be wheeling and setting. Dept. 4. This record would show kiln number, workman's name and number, class of work, kind of brick, number of hours, number of barrows, quantity, rate per hour, rate per thousand, amount. The operations are sorting and wheeling for shipment.

Now come sundry items, such as dryer's report, showing kiln number, time started, finished and wood used; burner's report, showing kiln number, time started, finished, coal used; also sundry time sheet covering boilers and engines, repairing machines, repairing kilns, carpenters, drawing wood and coal, drawing ashes, general work. What we next require is a loose leaf binder carrying a tab for each kiln, with a set of time sheets carrying say, two weeks' pay. This sheet would show the kiln number, department number, workman's name and number, class of regular work, with columns showing the different operations in each department. These sheets would be carried in colors for each department, the same as daily sheets. This as specified would carry the four departments with a sundry sheet under each kiln. When the kiln is loaded on cars or delivered we can then take a recapitulation of the assembled information, add to this fuel, which has also been assembled, and the unproductive percentage, making a total cost of the number of brick loaded of No. 1 quality. This will very easily give you your cost per thousand as suggested. Of course the bonus proposition can very easily be taken care of by checking the tally from the machine from the daily sheets to the summary under the kiln divisions, and this will show in the totals.

Now after you have run the system so far suggested for a short time the manager will be able to have placed in his hands a statement showing the daily output and cost. This sheet would show the quantity of bricks made by each machine, indicating time in money for each department, the total cost of sundries being placed in a summary on the same sheet.

City Engineer Rust has recommended that Mr. J. D. Watson, of Birmingham, England, and Mr. Rudolph Hering, of New York, be engaged to make a report on the whole problem of sewage disposal for Toronto.


SHINGLE ROOF
GRADE
UNDERSIDE OF PLASTERED CEILING TO VERANDAH
BALUSTERS
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1
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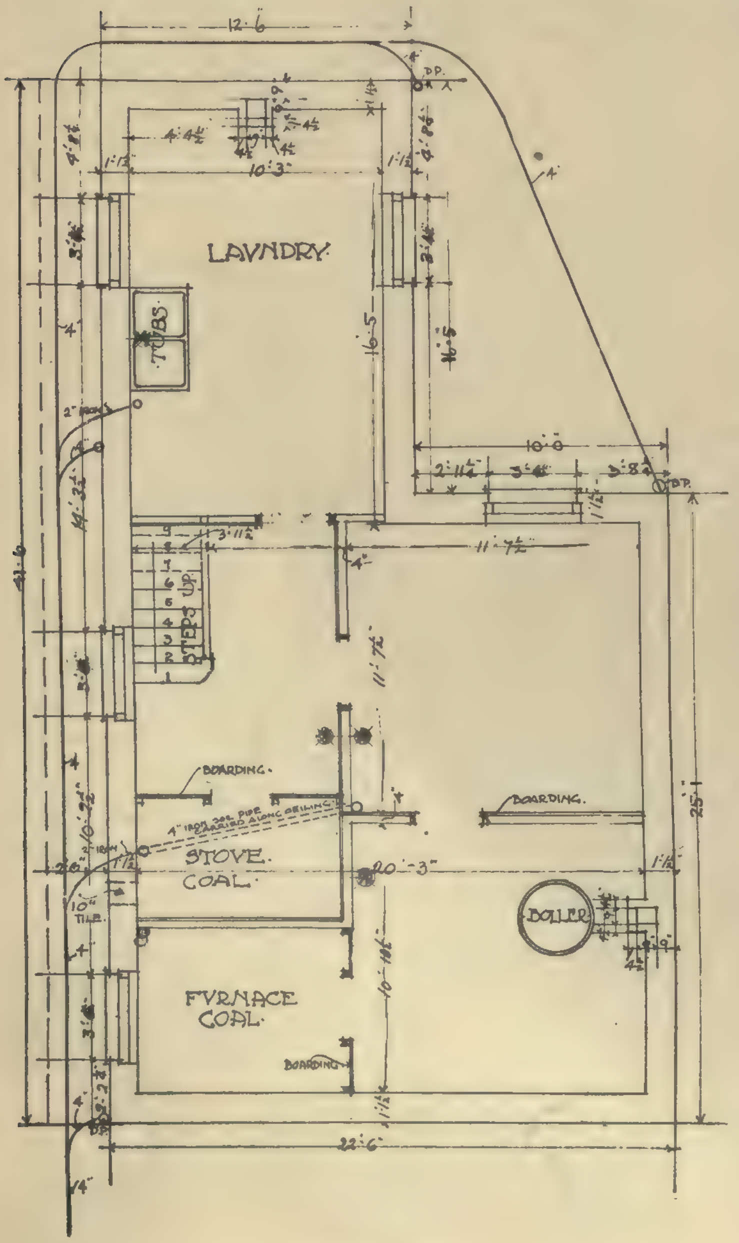
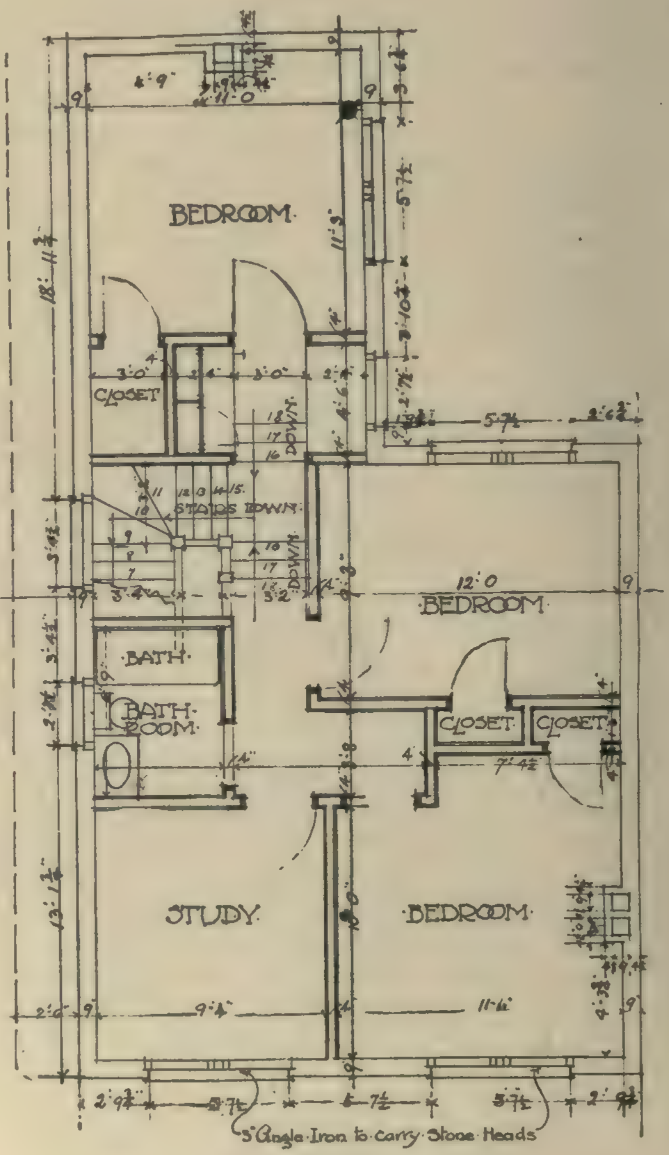
5
6

Front (south) and Side (west) Elevations of a $3,500 House.



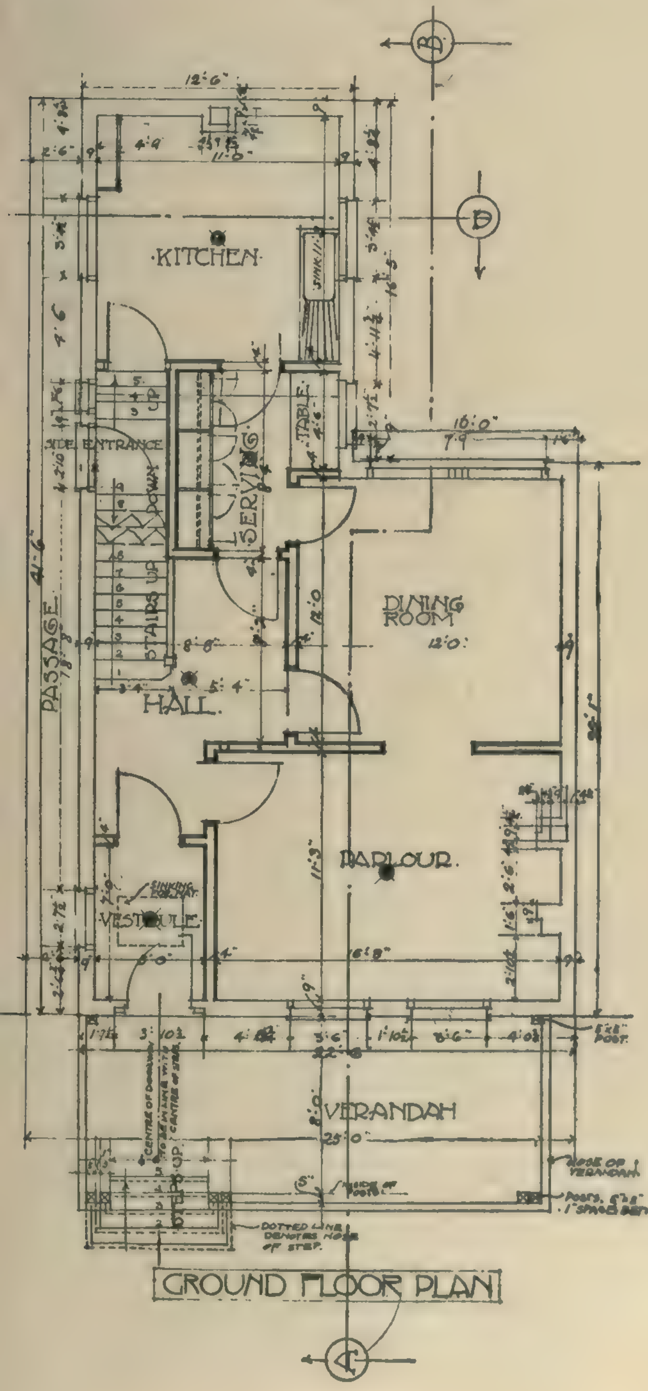
Basement Plan.



First Floor Plan.

A Moderate Cost Residence.

The residence illustrated herewith was designed by Messrs. Sproatt & Rolph, architects, Toronto, for Mr. F. S. Harris, and was erected on Aberdeen avenue, Toronto, at a cost of $3,500. The most notable features in connection with this house are its solidity of construction and its low cost. The architects' general out-lay is worthy of following. Plans are shown of the front elevation, side elevation, basement, ground floor and first floor. Excellent domestic facilities are provided in the basement, most noticeable of these being the generous space alloted to the laundry. On the ground floor are provided a convenient hall, two reception rooms and kitchen. Accommodation is provided on the first floor for three bedrooms, study and bathroom. While of necessity no architectural elaboration could be given to this house, its neatness of design and its general utility will commend it.



Advantages of Rich Mixtures for Concrete.

One has only to see concrete, of proper proportions and good materials, such as 1 cement to 3 sand and 5 or 6 stone, mixed, to marvel at the wonderful binding qualities of the cement when he observes this mixture at the end of a few days, says E. S. Larned, in the "Cement World"; he will note, however, that the cement must be spread out pretty thinly to fill the interstices of the sand and coat the surfaces of the individual grains three times in volume the amount of cement used. If the sand, however, be poor by reason of its geologic origin, mineral composition or decomposition, or because of excessive fineness, or its contents of fine material of a non-siliceous nature, then it is useless to expect good results of such proportions as 3 of sand to 1 of cement, and only careful analysis and test of the sand will enable us to judge as to whether it should be used at all, and, if so, in what proportions to attain the desired results within the required working limits of 7 or 28 days.

The general tendency in all reinforced concrete construction in the best practice is toward richer mixtures, particularly for column, beam and slab construction. The economy and logic of this is readily seen.

1. It makes possible the more economic handling of forms.

2. It is a safeguard against the dangers of average poor sand.

3. It means added strength and insures closer and more perfect contact with the steel.

4. It reduces to a minimum the personal equation in mixing and placing the concrete, the latter operation sometimes called "unmixing."

5. It means better fireproofing in that the aggregate is better covered and protected.

6. It is denser, stronger and more waterproof.

7. The difference in cost per cubic yard of concrete is nominal and much less than appears by reason of the advantages under Nos. 1 to 6.

The actual difference in cost of cement alone, per cubic yard of concrete, is given below, the assumed cost of cement being $1.50 per barrel, net:

Proportions	Cement required. Barrels	Cost of cement per cu. yard
1 : 1½ : 3	1.90	$2.85
1 : 2 : 4	2.48	2.22
1 : 2½ : 4	1.38	2.07
1 : 3 : 5	1.14	1.71
1 : 3 : 6	1.02	1:53

We are all reminded in this connection of the small percentage cement bears to the total cost of the completed work; in other words, if reinforced concrete in building construction could be figured at as low an average cost as $20 per cubic yard, the percentage cost of cement would be as follows for the several proportions given:

	Cost of Cement.
1 : 1½ : 3	14 per cent.
1 : 2 : 4	11 per cent.
1 : 2½ : 4	10 per cent.
1 : 3 : 5	8½ per cent.
1 : 3 : 6	7½ per cent.

The greatest gift in the world is the power to be happy, to be agreeable, to be optimistic. Friends will gather about such a man; his enemies will depart and the people will love him. As a radiator of good cheer and encouragement, he is a desirable citizen and death to the grumps.

The Evolution of Concrete Reinforcement

The Development of Steel Reinforcement—Interesting Paper read by H. F. Porter at the Cleveland Convention

At the recent annual convention of the American Cement Users' Association at Cleveland, O., Mr. H. F. Porter, of Philadelphia, Pa., read an interesting paper, entitled, "The Evolution of Concrete Reinforcement." Mr. Porter said in part:

In this paper we will consider the development of one item only—the steel reinforcement, which is, relatively speaking, the backbone of the construction. Formerly no attempt was made to ensure accuracy in the placing of the reinforcement. All was left to the intelligence of the workman, with the result of confused and tedious installation, general sloppiness, ruinous waste of time and materials, unsightly workmanship, excessive cost, and, worst of all, dire calamities—a formidable array of charges against "loose-bar" installation, possibly, but it is only the indictment of slovenry and haphazard wherever and whenever found. Specifications, to-day, that permit of these practices—"any old way good enough, so long as the theoretical amount of steel is provided"—are criminally negligent.

Let me quote from a specification which is as it should be:

"All steel to be of best quality made from original billets and in strict accordance with the regulation standard for structural steel. It shall be free from all scale and laminations and defects endangering the strength of the material. It shall also be free from all dirt, oil and rust pocks, although a slight film of rust is permissible. The ultimate strength shall not be less than four times the safe unit stress used, and the elastic limit less than two and a half times. All reinforcement to be properly fabricated and supported in place, so that all parts shall remain in true position and alignment until locked in the setting concrete. All tensile stresses, theoretical and practical, that may occur in the structure and any of its parts, shall be fully and properly provided for by steel reinforcement. In general, the reinforcement shall run as continuously as possible throughout the structure, and full development of every piece provided by suitable end-anchorage and lapping. Diagonal tension in beams to be cared for completely by diagonal reinforcement, either a part of or rigidly attached to the main reinforcement. In the slabs, these stresses and the negative stresses to be cared for simultaneously with the positive stresses, by elevating a sufficient number of the bars across the supports, providing in effect a catenary curve reinforcement.

Caring for Vertical Tension.

"Vertical tension to be cared for by vertical loops of steel, passing around the lower horizontal bars and extending well up into the compression flange, in which they shall be well anchored. These loops or stirrups shall be spaced not farther apart than the effective depth of the member and at progressively diminishing intervals towards the supports. In case of T-beams vertical stirrups are necessary to guard against possible separation of the rib from the slab along the plane of junction and to ensure the full and proper development of the T-action. All placing of reinforcement shall be done before undertaking to concrete, so that in amount and position it may be easily and fully checked before any concrete is deposited; conversely, no steel shall be left to be placed while the concreting is in progress. In slabs and walls, if bars be used, cross or shrinkage bars shall be provided at proper intervals, the intersections securely wired or clamped, and the bars properly and securely spaced and supported in position, prior to any concreting."

This is almost the exact counterpart of a specification from which a large number of important structures have been erected in and around Philadelphia, and in Toronto, Canada. It should be apparent to all that they are couched in no mistaken or mistakeable terms—they were written to exclude the use of the criminal "loose-bar" methods, and to compel the use of a superior unit frame fabrication, either field or shop assembled. In considering the evolution of concrete reinforcement, we have a two-fold guide—efficiency and economy. When these walk hand in hand, then we have the ideal. We have satisfied the criterion, "the best for the least money." There have been many frames on the market which have been efficient, so far as taking care of the stresses theoretically and practically, but all have had a hard struggle for existence because of their excessive cost. In the run of competition—the survival of the fittest—they have one after another fallen by the wayside. To really master the situation, it has seemed necessary to provide a unit frame at no greater cost than the far less efficient "loose-bar" methods. This is an error of judgment which only experience can correct. Judged by the incomplete and faulty cost keeping records of "loose-bar" installations, unit frames will never equal this requirement. Weighed in the balance with the value in dollars and cents of greater accuracy, greater confidence, and greater speed of construction, not to mention the saving possible by the leeway afforded in calculation and the reduction in inspection necessary, unit frames are even now more economical. This fact will ultimately lead to the universal adoption of unit frames, either shop or field fabricated. It will be a happy day indeed, for those who have the highest good of the industry at heart, when "loose-bar" methods are forever a thing of the past.

Three Types of Unit Frames.

Under the heading "Unit frames," there are ordinarily three general types—field fabricated, shop fabricated, and "trussed" frames. Let us consider their respective qualities in the order named. Field built frames are, as the name signifies, assembled at the site of the work, the raw materials coming direct from the mill, all bending, trussing, wiring and fabricating being done right on the spot. If the work be carefully executed—bends correctly made and wiring properly done—and proper means are taken to maintain the reinforcement in correct position, the field-fabricated method may be very successful; but from the very nature of things, it is a tedious, unscientific and expensive mode of procedure. It cannot claim to be "efficient" in the full and proper sense of the word, and is at the best only a make-shift. It involves too great a waste of time and money on preliminary and minor details, and introduces too many chances for errors of both carelessness and ignorance, to withstand final elimination.

Secondly, the "shop-built unit frame," of which the "Unit Girder Frame," patented by Emile G. Perrot, of Philadelphia, is the progenitor. In its original form, this frame is now obsolete, although in modified and improved form it is still on the market. It died a natural death—not because it did not fulfil the requirements of safety, but because it was too cumbersome and costly.

There were other objections, more incidental and trivial than vital. It was good, but not good enough. To those who are not familiar with this type of frame, I will explain that it was built on the same lines as the field-built systems, but all mechanical work and assembling was done in the factory; wiring was likewise eliminated, all affixing being accomplished by use of metal clamps. The frame went to the job a complete unit ready for placing. A vital disadvantage of this and all similar frames is the space required in shipping, with consequent undue expense for transportation and handling in all the operations preliminary to final disposition. Another disadvantage is the difficulty and expense of altering or remedying mistakes after the frames have once left the factory.

We come now to the third general type—that combining the minor reinforcing members with the main members in the process of manufacture, either by rigid attachment through the natural fibres of the material, by mechanical clamping or by electric welding. This type has met with a wide usage and is still a favorite in many quarters. For many purposes—such as isolated, rectangular sections freely supported—it is almost ideal; but it is not and cannot be a sovereign panacea for all the troubles of the reinforced concrete constructor. Especially in building construction, where practically all beams are T-sections, and it becomes very necessary to have a positive metal bond between the rib and the superimposed slab that forms an integral part of the member, such reinforcement is of itself inadequate. It then becomes good practice, if not absolutely essential, to have through the medium of vertical stirrups a positive tie between the horizontal reinforcement below and the slab reinforcement above. If installation were in every instance to be monolithic—that is, if soffit and slab were to be always poured in immediate sequence—it would perhaps not be so essential, but the reverse is more the rule, so that it does become for practical reasons indispensable. It is mostly for this reason that the building codes of many of our municipalities require the presence of vertical stirrups the entire length of the beam, spaced not further apart than the effective depth of the member. No type of reinforcement dependent for the development of the proper action, that is the correct distribution of stresses, on the inconsequential grip of a thin fin of steel in a few square inches of compression concrete, can without availing itself of auxiliary devices that mean extra expense, satisfy this condition. Moreover, in the simplest cases, this type of reinforcement cannot in cost compete with field-fabricated methods, involving no special, patented sections.

A Fourth Type of Unit Frame.

What I wish especially to place before you for your consideration, because it has grown partly out of my individual experience, is another type of unit frame, which is, roughly speaking, a cross between the first two types. In other words, it is partly shop and partly field fabricated. It is a system devised to fulfil most economically the requirements of the kind of specification before quoted. As the outgrowth of a practical experience whose guiding star was the two-fold ideal of efficiency and economy, it embodies the simplest principles and is adapted to the widest possible range of choice in materials. Thus, it may be confined to plain bars alone; it may be confined to deformed bars; it may use both kinds in combination; and, finally, either or both may be used in combination with a mesh for slab reinforcement. Its gauge is thus broad and generous enough to take care of all conditions and all tastes. It has in the past year and a half entered into the construction of upwards of fifty structures of note, aggregating in value over $50,000,000. First called the "Philadelphia method," it was subsequently rechristened the "Economy Unit Frame," and under this name is now on the market.

The "Economy Unit" is shop-built in so far as all mechanical work necessary is done in the factory. It is a field built system in the respect that the actual assembling into a frame is done right on the job—indeed right in the molds, so that the material is kept in simplest possible form for ready and economical handling until the very last moment. No attempt is made to fabricate the heavy and light elements of the reinforcement into an unwieldy cage in the factory. The stirrups alone are fabricated into a frame of itself. This stirrup frame, on account of the pivotal action allowed by a special form of spring wire clamp employed in attaching each stirrup to a longitudinal or frame bar at each bend of the stirrup, may be collapsed for ready and compact handling from the instant it leaves the factory until it is desired to place it in its final resting place. It is then pulled into upright position again, regaining its original form exactly, and dropped into the moulds. The upper ends of all stirrups being formed into a hook of special design, the whole frame comes to rest in the mould in exactly the proper position, constituting a saddle in which the main reinforcement is placed and maintained in position. Little metal separators are employed in addition to hold the bars in proper position relative to one another and the stirrups. Little arms on these metal separators serve the additional purpose of preventing lateral displacement of the reinforcement in the mould.

The Use of Frame Bars.

As to the use of the "frame bars"—which make the frame a possibility—the upper pair, catching on the under side of the hook of the stirrups, form in effect anchors to increase and distribute the grip of the stirrups in the compression flange, thus materially stiffening the beam. They also serve as shrinkage bars for the slab, and, to many engineers who deem the presence of some steel necessary in the upper fibres, they form a useful part of the reinforcing system. Furthermore, they serve the additional and very useful purpose of providing support for the slab bars as they cross the beam, compelling them to assume to all practical purposes a catenary curve. This fulfils another requirement of the specifications before quoted. By occasionally—every three or four bars—passing a bar underneath the frame bars a further enhancement of the tie between the rib and slab reinforcement is obtained. The lower pair of frame bars, in addition to spacing and holding the stirrups at the bottom, as the upper frame bars do at the top, serve as fireproofing bars to the main steel, from which they are separated by the thickness of the stirrup stock. Obviously, in a fire severe enough to spall the concrete on the under face of the beam these would interrupt the checking to a large extent, performing a function similar to that of the bars on the under side of a fireproofed steel. Moreover, their tensile strength may be utilized if needed. Ordinarily inconsequent for this purpose because of their small diameter—1-4 or 5-16-inch—by using a larger section, an addition to the workable tensile area may be realized, which affords a very convenient margin of adjustment to the designer.

There is thus practically no excess material used, nor any wiring, with its expensive hand-labor, required. By the use of a few simple, spring-wire clips, inexpensive alike for the making and for the attaching, the whole thing is made possible without adding but a fraction to the total cost based on the total tonnage. All mechanical work being performed in the factory, where the well-known economies of factory production may be realized.

the cost is less than for all field built methods of perhaps equal efficiency. All cutting of material for stirruping being made to exact length, the waste item incident to field making of the stirrups is eliminated; and all bending of same being done by automatic machines, another important saving results. Mistakes may be easily rectified in the field. Inspection is easy, installation is both easy, rapid and cheap, and last, but not least, a very superior construction results, which, under the present requirements of the building laws, develops extraordinary efficiency. The same principle is applied to column reinforcement, both rectangular and spiral, with equally good results, and by the use of similar spring wire clips and spring-wire steel-lock spacers the problem of spacing and supporting the slab and wall reinforcement is as simply, efficiently and economically solved. In the writer's experience he has found this system cheaper than loose-bars and infinitely more satisfactory.

Analysis of Steel Cost of Loose-Bar Installation, Building Construction.

Base at mill	per ton	$30.00	
Freight from mill to siding	per ton	2.00	
Hauling to site of work	per ton	1.00 to	$2.00
Alowance for sizes below base	per ton	1.00 to	2.00
Cost f.o.b. job		$34.00 to	$36.00
Racking		$1.00	
Bending and hooking		2.00 to	5.00
		$37.00 to	$41.00
Hoisting		1.00	
Placing		5.00 to	10.00
Total cost in place		$43.00 to	$51.00
Allowance for waste		.50 to	1.00
		$43.50 to	$52.00
Cost f.o.b. job		34.00 to	36.00
Cost of installation per ton		$9.50 to	$16.00

Average, $13.75.

To this must be added an amount to compensate for the increased cost of the total operation due to the delay and confusion incidental to every loose-bar installation. For example, the cost of placing the concrete alone may easily be increased 100 per cent. by the interference incurred. In order to place concrete efficiently and economically, it is necessary to have the fullest and freest hand possible once the operation is begun. This is only possible when all steel is in correct position and provision made to maintain it there during the succeeding operations before undertaking to concrete. With a loose bar or semi-loose bar installation this is never possible. In case reinforcement is placed beforehand and well supported and wired, we have, in effect, a unit reinforcement which allows us to concrete to fullest advantage. The cost of such supporting and wiring, if thoroughly done, will average $5 per ton. The total charge for steel in place, above cost delivered on job, will then average between $15.00 and $20.00 per ton.

Contrast the previous figures and facts with those of a unit installation, according to the "Economy" method.

It will be observed that the cost for unit system that fulfils all the requirements of efficiency, is less than the cost of a loose bar installation. Weighed in the balance with reduced cost of total operation, due to facility and speed of operation made possible, it is far cheaper. Consider the reduction in all sizes, by reason of the greater accuracy guaranteed, and the advantage is still greater. Engineers aware of the inaccuracy of loose bar methods allow, or should allow, a very material factor of carelessness when these are to be used. Assured of careful, accurate installation—as is the assurance with a unit fabrication—they may very well reduce the total cost, by closer calculation, from 10 to 20 per cent.

Analysis of Steel Cost for Economy Unit Installation.

Base at mill	per ton	$30.00	
Freight	per ton	2.00	
Hauling to site	per ton	1.00 to	$2.00
F.O.B. job		$33.00 to	$34.00
Total cost of fabricating steel (includes assembling of stirrup frame, trussing of bars, and all accessories)		5.00 to	8.00
Ready to place on job		$38.00 to	$42.00
Handling charges, receipt on job until ready to place in moulds (includes racking and hoisting)		1.00 to	2.00
Placing in moulds		1.00 to	2.00
Brought forward		38.00 to	42.00
Total cost in place		$40.00 to	$46.00
Average price per ton in place, for base of $30.00			$43.00
F.O.B. job net			33.00
Average			$10.00

Total cost above base, average per ton, $13.00.

A Record Brick Kiln.

What is believed to be the largest brick kiln ever built on this continent was recently successfully treated by Russ Humber, of Victoria, B.C., at the Humber Brick Works. This kiln contained 1,500,000 brick. In order to accomplish the work 104 fires were used and 500 cords of wood were consumed. The experiment proved that a million and a half of brick can be burnt as successfully as half that amount. The yards of the Humber Brick Works are the oldest in British Columbia, having been established by the late Maurice Humber in 1877. These have been managed by Russ Humber since the death of his father in 1902. The kiln was burned with red fir, which is the main fuel for brick burning there. The Humber works are the oldest brick manufacturing plant in the province and still make brick in the same old way, except that they now turn the mills with steam power instead of horses. They make all brick by hand and turn out 50,000 per day from the 10th of April until Sept. 10th outdoors. This year they did not lose a single brick.

Mr. Humber says: "I claim I can make brick in the same old way cheaper than with all your machinery, that is if you have had, like myself, 27 years' experience in the business. I do not say everybody could do this, as a machine is cheaper when you do not understand much about the business. Of course, there is a lot of worry when you always have 150,000 thousand brick under the canopy of heaven, and you have to watch the weather maker. The brick are water-brick, hand made, six to a mould, with twelve off-bearers, six tempers, and six moulders. I make 50,000 a day. This kiln was burnt outdoors and is the old style up-draft and did not have a board on it from start to finish. I intend taking a trip to see all the different yards in Canada and the States, as I want to see with my own eyes an up-to-date yard, manufacturing brick 300 days in the year under cover. This is what I want, and I am going to have it. Then I might be able to compete against myself with a brick machine, but I want a different way than the one they have in this country."

It is to be noticed that the lime manufacturers who hydrate their product are the busiest men in their line. The contractor who gets accustomed to using a good hydrate sees where he gets his and that is what builds up the demand. The guaranteed job never costs any extras.

In the Courts—Recent Interesting Cases

Union and Non-Union Employe.—Graham v. Bricklayers' and Masons' Union was an appeal recently brought in the British Columbia Court from the judgment of Chief Justice Lampman in favor of plaintiff in an action for damages for interference by defendants with his employment. The plaintiff, a stone mason, applied for admission to the defendant union, and was rejected because he considered that the proposed test of fitness was unfair, and would not submit to it. The union notified the employer that it was against their rules to work with non-union men, and that the men would be called out if the plaintaiff was kept at work. In consequence of this notice, the plaintiff's hiring was legally terminated, although but for this notice he would have been retained, and as the result the plaintiff was unable to get employment at his trade. The court held that harsh acts did not necessarily constitute illegality. The union could lawfully give notice to the employer that they would withdraw from his employment unless the conditions were made to their liking, and give him the alternative of employing themselves or those with whom they objected to be associated. It did not follow, however, that it was lawful for a union, under color of exercising this right, systematically to coerce various employers whom they can influence not to employ the obnoxious individual, and in that way attempt to deprive him of his right to make his living by his chosen calling; for in such event, the purpose of their action being to molest him and to deprive him of his right to make his living except on conditions of their dictation, their action became a legal injury and an actionable wrong. The court held that the plaintiff had not produced evidence to show that the purpose of the union was to molest him in the peaceful pursuit of his calling and if possible prevent him from making his living thereby, except on conditions of their own making. The appeal was therefore allowed and the action dismissed.

Contract Money in Dispute—Alleged Non-Fulfilment of Work.—Action has been entered against the sisters of the congregation of Notre Dame, Montreal, for $40,311 by Frederic R. Welch, of New York. The case is in connection with the construction of a large convent. J. T. Finn & Company, of New York, were awarded the contract for the installation of plumbing, heating, ventilating and electrical apparatus in the building, and it is claimed that although the work cost $100,000, a sum of only about $59,000 has been paid by the sisters of the congregation. The account for $40,311 which has led to the action is disputed by the sisters because they claim that they were obliged to have the original plans changed and the work completed, after J. T. Finn & Company were supposed to have concluded it.

Municipalities and Highways.—Gallagher v. County of Lennox and Addington, was an action for damages sustained by the plaintiff by injuries to his horse while travelling upon the highway leading from Napanee to Adolphustown. The accident occurred at a spot which was notorious for the accumulation of large snowdrifts and Chief Justice Madden contended that with very little expense, either by double tracking or snow fences, the whole difficulty could have been overcome. In entering judgment against the defendant for $151.50 and costs His Lordship held that it was incumbent upon all municipalities to adopt modern methods of making the public highway safe at all times.

Architect's Contract.—In the case of Wilson v. Ward, an appeal by defendant in the British Columbia court from the judgment of Mr. Justice Irvine in favor of plaintiff, an architect, in an action for $965 for two sets of plans, defendant resisted on the ground that he had made no personal contract, and that if there was a contract the plans should have been for a building to cost not more than $18,000, whereas under the first set of plans prepared by plaintiff the cost was $20,000 and under the second $26,000. Chief Justice Hunter held that the contract was contingent upon the understanding in regard to the limited amount of $18,000 and accordingly allowed the appeal.

Mechanics' Lien Act Case.—A motion was recently made before the Master in Chambers at Osgoode Hall in the case of Robinson v. Bullen under the Mechanics' Lien Act for summary judgment against the defendants on the ground that one of them had not put in any defence and that the others had no real defence and because one of them had frequently admitted the plaintiffs' claim and promised to pay it. The Master held that such a summary judgment could not be given inasmuch as when proceedings were taken under the Mechanics' Lien Act they must be confined to the remedies which it gave.

Local Improvement By-law.—Judge Meredith recently gave judgment in a Divisional Court of Ontario in the case of an appeal by the defendants from the judgment of Judge Anglin in the case of Elliott v. the City of St. Catharines. The motion was to quash a by-law for the construction of a sewer because one of the members of council who voted for it was a property owner to be benefited by the sewer, and without his vote the necessary two-thirds would not have been obtained. Judge Anglin had given judgment quashing the by-law, but Judge Meredith stated that in the opinion of the court no interest could disqualify a councillor from performing his duties, that sprang solely from his being a ratepayer in the municipality. The court therefore reversed the decision of Judge Anglin and the by-law stands.

Obstruction of a Highway.—In the case of Harvey v. the Biritish Columbia Boat & Engine Company, which came up before Judge Clement recently, action was brought for an injunction to restrain the defendants from obstructing the highway adjoining the plaintiff's property in Vancouver and for a mandatory injunction requiring them to remove obstructions interfering with the plaintiff's access to the property. The plaintiff leased property at the corner of Georgia and Denman streets and the defendants are alleged to have obstructed Denman street at its northerly end by the construction of a small building, the foundations of which were some feet under the original surface of the ground. There had also been constructed a capstan for drawing up ships, boats and lumber and other boat building material had been piled on the street north of the tank. Judge Clement in his judgment stated that the plaintiff's right of ingress and egress was a private right along this highway, and he granted a mandatory injunction for the removal of the obstructions and a general injunction in perpetuity upon placing any obstructions upon the highway. The judgment carried costs for the plaintiff.

Hon. Mr. Morrissy estimates the damage to provincial public works in New Brunswick, caused by the late freshet, at $200,000.

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

The Cost of Concrete Bridges.

Concrete, either plain or reinforced, as a material of bridge construction possesses the merit of being adaptable as a substitute, within limits, for both stone masonry and steel framework, and of combining the qualities of both. It is equal to and may be more economical than stone masonry for abutments, piers, retaining walls, coping and parapets, and in many cases makes an arch available with its manifold advantages where a stone or brick arch would be impracticable.

It is found also to be an advantageous substitute in the shape of jack arches or reinforced slabs for steel floor troughs and buckled floor plates on steel bridges, whereby we have a composite structure, not strictly reinforced concrete, but a combination of steel members and concrete members. The resulting product, when the design and workmanship are good, is a rigid, enduring and economical bridge.

The limitation of the proper and economical employment of concrete in bridge structures can hardly be stated, certainly not with any degree of definiteness. Conservative designers are not in entire accord with respect to either methods of use or allowable working stresses, and comparisons of value and cost between all steel and part of all concrete or reinforced concrete can only be made on finished designs and for the same site. Even then estimators may not agree as to which will cost the more, and, if we may judge by the wide range of prices quoted in contractors' proposals ,the contractors themselves cannot more accurately determine relative values in cost. To the purchaser the cost of a bridge is the contract price; the cost to the builder should, of course, be less.

The actual cost of a job to the builder is usually not published and is rarely divulged to even the engineer, and an engineer's basis of estimate must be the bids and contract prices previously obtained.

Any list of costs will exhibit great variation in the figures for structures of the same class and similar dimensions and conditions, and when the most infinite variety of conditions and combinations of varieties are considered, the difficulty of conveying useful intelligence on the subject is apparent.

Elements Which Affect Cost.

The length of span, width, height, depth and character of foundations, length and shape of wings, loads to be carried, amount of filling or grading, railing or parapet, character and amount of paving, plain or decorative architecture, character of the concrete, plain or reinforced or rubble, market price of materials, and accessibility of the work to railroad service, all affect the question of cost.

It is therefore impracticable to select any unit of measure of a bridge and use it as a reliable basis for estimating cost. In a table covering eighteen concrete arch bridges recently built in Philadelphia the concrete price spread upon the span area, the clear span by the width, varies from $3.11 to $9.74 per square foot, and it varies from $1.73 to $7.39 per square foot of area occupied by the ground plan to ends of wings, the latter extremes being not on the same bridges as the other two. The average of the lot was $6.25 per square foot of span area and $3.50 per square foot over all, most of them being single span bridges with long wings, and all being highway bridges designed to carry loads of 40 tons on two axles 20 feet apart. All have ornamental concrete balustrades and washed granolithic surfaces and paved decks, with electrical conduits and manholes, and water pipe and sewer well-holes, and some have pretty deep foundations.

If the whole contract price be set against the yardage of the concrete in the structure the unit costs vary from $8.50 to $11.25 per cubic yard, averaging $9.75.

It is found that in the circumstances under which the bridges referred to were built steel plate girder bridges will cost more than concrete arches, the difference being considerable. Several opportunities for fair comparison have made this clear, as great a difference as 25 per cent. of the higher being indicated. This saving is in the first cost, and if we add the capitalized cost of proper maintenance of the steel structure, which seems to be a fair element in the comparison, the advantage of the concrete arch appears far greater. A real money value also attaches to the superior beauty and attractiveness of a decorative arch structure in almost any locality, a question that almost always is the subject of consideration and decision in designing public work, for it must be determined what amount is proper to be expended for mere appearance.

Composite Bridges.

The composite bridges, steel structural frame with concrete envelope, share with the arches, or at least promise to, the quality of permanence, and therefore exemption from expensive maintenance charges. As between the ordinary steel plate girder bridge with buckled plate floor for permanent paving, and the composite type, the lower first cost is with the composite if the spans be short, for the greater dead weight of the concrete floor tells on the long main girders whose section is usually determined by the general load, dead plus distributed live, while the individual floor members are determined by the heavy concentrated live load. The embedment of the floor stringers or joists in the concrete jack-arch construction effects a saving of steel, first by dispensing with floor plates, and second by permitting lighter stringers to be used, for the jack arches distribute a concentrated load over, say, three beams where with a buckled plate floor each beam must carry the whole concentration, and besides, the embedment of a beam in concrete increases its carrying capacity about one-third.

Where it is the practice to protect steel bridges over railroad locomotive service by means of a wooden ceiling under the whole underside of the bridge, the economy of the concrete floor is more marked because such a ceiling costs about 25 cents per square foot and lasts only a few years. This first cost alone will pay for about 1 cubic foot of concrete in the floor, and only about 15 to 18 inches average thickness of floor concrete is required. As steel floor plates with their rivetting cost from 50 to 70 cents per square foot, the concrete floor appears to cost only about one-half as much as an all-steel floor, besides saving materially in the stringers. Floor beams may or may not be required to be heavier to carry the concrete floor. If they are not very long, the value of the concrete embedment may make up for the increased dead load stress. The main girders will need to be heavier than for the steel floor because little or no value can safely be assumed to be derived from the concrete casing.

The cost of concrete bridge work of almost all classes can be materially reduced and the service value of the concrete at the same time incdeased by the embedmnt in the concrete of suitable hard stone in size from that of spalls to the largest than can be conveniently handled or that will be comfortably accommodated in the compass of the forms. The economy of this construction depends upon the cost and shape of the embedded stone and the amount embedded without too much labor expended and without restricting the output of the concrete plant. It has been found that the percentage of the volume of the finished work that such stone amounts to varies from 25 to 40, or from 33 to 66 per cent. of the volume of the mixer concrete, according to the shape of the stone and the care taken in placing it.

The cost of handling and placing this approximate third is probably about equal to that of mixing and handling and placing an equal volume of concrete. The saving, therefore, should be the difference between the delivered cost of the concrete materials and that of the stone. If the stone delivered costs one-half as much as the cement and sand and gravel that, when mixed, equals it in volume, and if the embedded stone amounts to only one-third of the finished work, then the cost per cubic yard of the finished work is 80 per cent. of that of plain concrete.—Paper read before the National Association of Cement Users by Henry H. Quimby, Engineer of Bridges, Philadelphia, Pa.

Completing Works with a Reduced Appropriation.

In the execution of large engineering projects, it sometimes happens that the appropriations necessary to carry through the work on the lines originally laid down have to be reduced by the executive officers of the company or municipality for which the construction is being done, says the "Engineering Record." Few more difficult tasks confront the engineer than the direction of a job of this character, for in the majority of cases the conditions are unfavorable to the exercise of a free hand, either in the modification of the original design to meet temporary needs or in actual field construction. If the work is far advanced when the order comes to carry it to a temporary completion, the unit cost of the work may run up to an almost prohibitive figure, though after the work is considerably more than half done it may work out more favorably so far as the cost of the job as in part finished is concerned. If the work has to be cleared of all construction equipment and supplies before the balance can be handled, the cost will inevitably be raised for the work as a whole, unless at the later period the cost of labor or mtaerials takes an unexpected drop.

An engineer charged with the responsibility of producing economical results either in field construction or operation in a case where the total appropriation has been cut, ought to state his position with the utmost frankness before accepting such duties. It is not infrequently the fact that a non-technical board of directors will expect the same economy in a partially finished piece of work as in the installation if carried to the logical conclusions of the original designs. It is most important that the engineer who takes up this kind of a task shall determine to his reasonable satisfaction what sort of construction economy and what sort of operating efficiency he can count upon in a partially finished piece of engineering before he assumes charge of the problem. Otherwise, when the system is put in commercial service with less than its ultimate capacity to handle the business at the best economy planned in the original design, the engineer in charge may find that his superiors are disappointed with the results. For example, a new power plant of 10,000 k.w. capacity may be designed with the reasonable expectation of producing electricity at a cost of 0.6 cents per k.w. hour. If the completion of the plant has to be stopped when a capacity of 3,000 k.w. is reached, perhaps, for perfectly legitimate reasons, it may easily work out in that particular instance that the construction cost of the temporary plant per kilowatt will prove to be $200 or more, against a final cost per kilowatt of $120, and because of the cut in appropriations the cost of completing the plant, when the time finally comes for the work to be pushed to its conclusion, may exceed by several thousand dollars the cost had the original plan been followed of building to full capacity for the size of installation contemplated. The fact that in most power installations the ultimate capacity is not intended to be completed at first does not alter the case for the plant which for lack of an expected market or other financial reason cannot be built as large as was at first planned. And so the 2,000 k.w. station may not be able to produce current under the conditions that prevail at its site at a lower figure than 0.8 cents per unit, though in other parts of the same state it may be that a plant of 3,000 k.w. rating may generate power at 0.7 cents. It is clearly to the advantage of the engineer to know just where the differences in cost come in, for it is a natural course for his superiors to compare the production costs of both plants of the same general size without making allowances for the difference in conditions that enable one to make a better showing than another.

The real problem before the engineer who takes charge of work is how to push it through at the lowest cost and in the shortest time consistent with good results. In many cases he may not be held to account for the operating economy of the partially finished plant, but whether he is or not, it is plainly his duty to handle the job to the best of his ability, and to leave as small a difference as possible between the anticipated and the actual cost, both of construction and operation. In some cases this kind of a task cannot be done without tearing out a part of the first work; in others, the original design can be followed to a certain point, when temporary construction of a special nature must be carried out, to be later replaced by the permanent construction of the original design. The possible complications are too numerous to be reviewed at this time, but the foregoing points must be looked after in the handling of the work.

Lime troubles in the manufacture of tile may be overcome by having a grinder or pulverizer, that will grind the material as finely as possible. The finely divided lime slakes more evenly and exerts its swelling action more uniformly throughout the tile. Another way is to try raising the temperature of the kiln, and getting rid of the lime by causing a new chemical action to take place. A sufficiently high temperature will cause the lime to unite with the silica, making a compound that will not be injurious to the tile.

Mr. J F M Stewart, secretary of the Toronto Reform Association for the past three years, has resigned to become the general manager of the Point Anne Quarries, Limited, which will operate quarries at Point Anne, near Belleville, Ont., and put crushed stone and rubble on the Toronto market.

The Construction of Small Concrete Piers

Description of Work on a line of the C. N. R., Together with Tables of Costs by J. H. Ryckman

An interesting feature of the Canadian Northern Railway is found on the Ottawa-Hawkesbury line about five miles east of Ottawa, at which point a steel viaduct with concrete footings and trestle approaches carries the track across a valley 800 feet wide and 100 feet in depth. This valley contains a flat 300 feet wide and at this point large ice-jams occur in the spring. The steel viaduct occupies the central portion of the valley and is 410 feet in length, being divided into 60-foot spans with 30-foot towers and an 80-foot span crossing the stream.

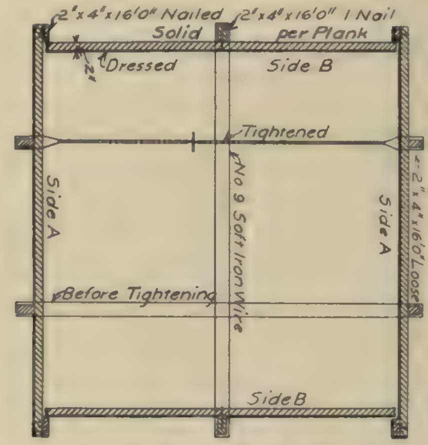
The flat is covered with from five to six feet of sand and clay, underlying which is a deep stratum of hard blue clay. Between these two is a layer of driftwood about one foot thick, bedded in sand. The excavations were made 12 feet square and carried down to a hard foundation. On the flat this was well below the bed of the stream, but was higher on the side hills. The average depth was 11.5 feet, the maximum being 15.2. The material was handled by an ingenious derrick operated by horse power. The mast was held by ordinary guys and the boom was fixed at an angle of about 45 degrees while in operation, but was adjustable. The bucket was lifted by a double purchase block, the fall of the line being carried to a pulley set a few feet to one side of the mast and then fastened direct to the whiffletree.

Site of Viaduct—General View.

Two crossed layers of 6x8-inch hemlock, 10 feet long, were placed under each pier before the concrete was put in, giving a 12-inch footing of timber. The concrete footings were then built up 10 feet square and 4 feet high. On these were placed the pedestals. These pedestals were all carried to the same elevation and were made 5 feet square at the top, with sides battered 1 in 12 to meet the footings, a 3-inch chamfer being made on the upper edge. The piers are mostly 19 feet high above the timber, but those next the creek and under the 80-foot span were made 22 feet, those on the side hills being shorter according to the nature of the foundation. The holes for the anchor-bolts were made 6 inches square on top, 5½ inches on the bottom and 4 feet deep. The boxings for these were set by a template resting on the chamfer pieces and set accurately with transit and tape before nailing solid.

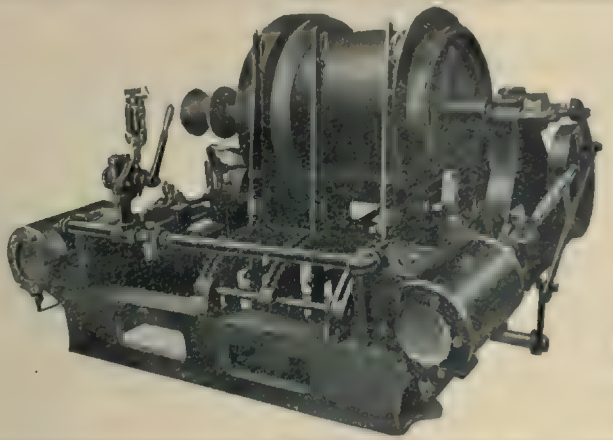
The forms for the footing were built of 2-inch undressed lumber, without nailing, and braced to the excavation walls. Most of this was easily recovered after the concrete had set. The pedestal forms were built of 2-inch lumber, dressed on one side. These were made collapsible, two sides, AA, being built solid and set up in the final position and the other two sides BB, fitted in plank by plank. The forms were braced every 3 feet in height with No. 9 soft iron wire, as shown in the diagram. These wires were cut in four days and the solid sides were then easily knocked off, leaving the planks of the other sides unsupported. Five sets of these forms were used, 16 feet in length. For the four long piers 3 feet were spliced to the lower end and for the shorter ones, the lower ends were cut off, as these were put in last.

The original specifications were 1 : 3 : 6 for the footings and 1 : 2½ : 5 for pedestals, but owing to the severe ice conditions this was increased, as shown in Table 1. The concrete was first put into the footing course and allowed to set a day or two. The carpenter then set up the pedestal forms and had everything ready to place concrete in them. A bond was made between the two courses by leaving large filler stones projecting and by wetting and covering the footing with a coat of mortar before starting the pedestal, which was then completed to about 5 feet of the top, when the anchor-bolt boxes were set. The pedestal was then completed to 3 inches of the top and after setting an hour or so, the template was removed and the pier finished off with 1 : 2 mortar, floated with a trowel under guidance of the engineer's level. The concrete was deposited moderately wet and the mortar was worked to the sides with a flat spade, giving a good, firm surface. The anchor-bolt holes were covered with 2-inch boards sealed with neat cement and the piers were washed with a coat of thin cement-water. This wash was applied with an ordinary whitewash brush, requiring one bag of cement to 25 square yards of surface, one laborer covering 7½ square yards per hour.



Plan of Form for Piers.

The concrete was mixed by hand, one foreman, five barrowmen, six mixers and one man in the form averaged 25½ yards per day, the maximum day's work being 38 yards with 16 men working. The platforms were placed close to the piers, the material being wheeled onto them, mixed and shoveled directly to place. Four batches per hour were handled on an average. Filler stones were



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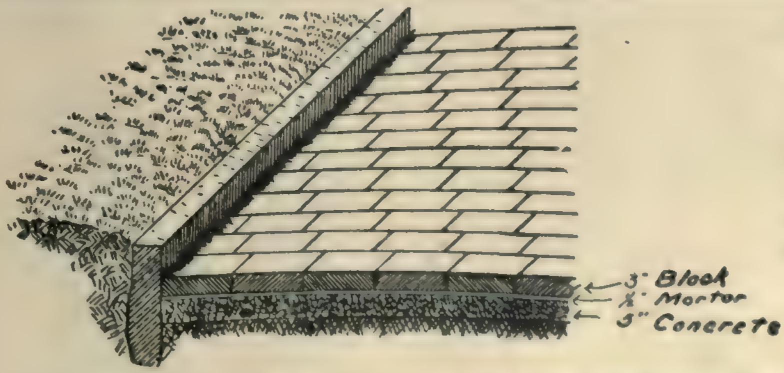

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placed throughout the concrete, the whole force carrying them whenever necessary. Two platforms were used, one for footings and one for pedestals, and were carried ahead as the work progressed.

The work was completed in 45 working days, beginning Sept. 21 and ending Nov. 13, 1908. The excavation required 35 days and the concrete 28 days. The construction was in charge of the Canadian Inspection Company, of Montreal, the writer of this article, J. H. Ryckman, being resident inspector.

Table 1.—Proportions of Concrete.

Footing, 298.5 yd., specified 1 : 3 : 6, takes 9-10 bbl. per yard, increased to 1 : 2½ : 4⅔, takes 1 1-12 bbl. per yd	1,293½	bags cement
Pedestal, 405 yd., specified 1 : 2½ : 5, takes 1 bbl. per yard, increased to 1 : 2¼ : 4, takes 1¼ bbl. per yard	1,997	" "
Top, 8 yds. 1 : 2 mortar	44	" "
Washing, plastering, etc.	15½	" "
711.5 yd. concrete used	3,350	" "

Extra cement due to increase, 596 bags.

Table 2.—Cost of Piers.

General expenses—		
Superintendence, etc.		$239.50
General labor		78.40
Interest and depreciation on plant and tools		70.50
Total		$388.40
Excavation—		
General expenses		$194.20
Foreman, 35 days, at $3		105.00
Labor, 323 days, at $1.60		516.80
Horse, 26 days, at $2		52.00
1,127 cubic yards earth at 77 cents—total		$868.00
Forms labor—		
Carpenter, 28 days, at $2.50	$70.00	
Helpers, 38 days, at $1.75	66.50	
		$136.50
Lumber—		
7,000 feet 2-inch, dressed, at $19	$133.00	
2,000 feet 2-inch, rough, at $18	36.00	
750 feet, 2x4-inch scantling	13.50	
Cartage, $2.50 per 1,000 feet	24.38	
Anchor bolt boxes, chamfer, etc.	10.00	
Less salvage, $10		
		206.88
Wire—		
Five rolls No. 9 soft iron, at 3 cents		12.00
Wire nails, 200 lb., at $2.50		5.00
Total		$360.38
Concrete materials—		
Filler stone, 173 yds., at 85 cents, delivered		$ 146.95
2-inch crushed stone, 555 yds., at $1.87½, delivered		1,040.63
Sand, 290 yards, at $1.25, delivered		362.50
Cement, 840 bbls., at $1.80, delivered		1,512 00
Cartage, at 15 cents barrel		126.00
Total		$3,188.08
Concrete labor—		
Foreman, 28 days, at $4		$112.00
Labor, 343 days, at $1.75		600.25
Total		$712.25
Total cost of concrete—		Per yd.
General expenses	$ 194.20	$0.273
Platform runways, etc.	68.88	.097
Forms	360.88	.507
Labor	712.25	1.001
Materials	3,188.08	4.481
Total	$4,523.79	$6.36
Extras—		
24,000 ft. 6x8-inch hemlock, 10 feet long, at $20		$480.00
Excavation, shorting 1,000 feet timber, at 30 cts., 1,500 feet lumber at 18 cents		57.00
Back filling piers, labor		162.00
Total		$699.00
Total cost of work		$6,090.79

Vancouver Builders' Exchange Meeting.

The Builders' Exchange of Vancouver held their annual meeting on Jan. 15th last. Alderman-elect S. J. Crowe, who has been president of the Exchange for the past four years, tendered his resignation. The following officers were elected for the ensuing year: President, E. G. Baynes; Vice-President, Bedford Davidson; Treasurer, James Young; Secretary, Miss N. Urquhart. The following directors were elected: Messrs. Crowe, Young, Ferguson, Wilson, Steves, McLennan, Davidson, Carter, Baynes, Hepburn, Shindler and McPherson. A motion was carried in favor of reducing the membership dues from $1 to 50 cents per annum. It was also decided not to hold any banquet this year, but instead to donate $25 to the Children's Society, $25 to the Alexandra Orphanage, and $50 to the sanitorium at Tranquille.

Large Order for Cement.

Messrs. John Gunn & Sons, of Winnipeg, have just placed an order with the Canadian Portland Cement Company for 80,000 barrels of "Star" portland cement, to be used in connection with the building of the power plant at Lac du Bonnet for the city of Winnipeg. The cement will be shipped by vessel from Port Colborne. This is believed to be the largest single order for cement ever placed in Canada, and indicates the extent to which the consumption of cement is increasing. A few years ago a few thousand barrels was considered a large order.

Prospective New Industries for Toronto.

Mr. Joseph Thompson, Civic Commissioner of Industries, Toronto, is optimistic with regard to the prospects of new industries being located in the city. He states that during the past two weeks he has had a greater number of applications for sites for factories than during the same period in 1908. For some time Mr. Thompson has had his hands full, showing prospective industrial settlers about the city and pointing out the advantages of various sites available.

The total of Canadian bonds and debentures issued during 1908 was approximately $210,000,000. A comparatively small percentage of these—probably less than 10 per cent.—were taken in the United States, and about twice the amount was absorbed by investment institutions at home. The preponderance of the bond issues, outside of Government offerings, were by municipal or public service corporations, the latter being for extensions or the liquidation of other maturing obligations.

The Toronto bricklayers are organizing to make a fight in favor of the use of brick in the construction of the trunk sewer and have collected considerable information designed to show that brick is a better material than concrete in the construction of sewers.

The 2nd vice-president of the Ontario Association of Architects, elected at the recent annual meeting, was Mr. E. L. Horwood, Ottawa, not Mr. J. A. Ewart, Ottawa, as stated in the report of the meeting.

Vining Brothers, of Niagara Falls, Ont., are putting up a concrete block building for the manufacture of concrete block machines. They expect to have it ready for occupation by March 1st.

Mr. Robert N. Irvine, for 25 years town clerk of Deseronto, Ont., has resigned. Mr. A. E. Davey has been appointed his successor.

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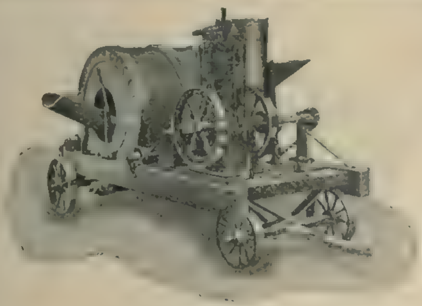

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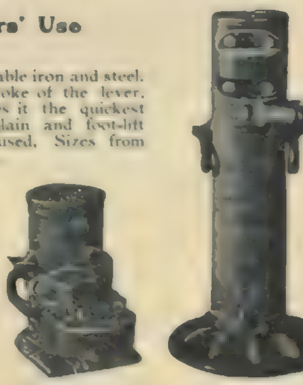

A Good Word for Vancouver.

Mr. E. Smallwood, president of the Smallwood Stone Company, of Elyria, Ohio, recently visited Vancouver, B.C. Mr. Smallwood has been connected with the stone-quarrying industry since he was 14 years old. He ships building material to many eastern cities, including Toronto.

Speaking of Vancouver, he said: "In an architectural sense it is a beautiful and imposing city. Some of the new buildings are as beautiful as any I have seen in my travels. The large number of stone buildings in Vancouver have given me, and will give other visitors, a very favorable impression. From talks I had with local builders I was surprised to learn that five excellent varieties of building material are available. This gives your city a unique advantage over any other city I know of. The two kinds of limestone are superior in quality, while the sandstone can not be surpassed. The local granite, while easier to cut than eastern granites, is their equal in color and texture. Vancouver has more fine stone buildings for its size and population than any other city of equal size."

Mr. Smallwood was amazed at the growth of the city since his last visit three years ago. With a view to making investments he has secured a lot of statistical information from the Vancouver Tourist Association and the Board of Trade.

Cement Company Assigns.

The Colonial Portland Cement Company has assigned to E. R. C. Clarkson, of Toronto, and a winding-up order has been granted. Mr. E. Y. Jackson, who made the application for winding up the concern, was the construction engineer and superintendent of the plant, and his claim represents salary. Mr. Jackson superintended the construction of the works of the company about a mile and a quarter from Wiarton, Ont., and he has been in charge of the plant since its completion. The company owned a marl bed about a mile from the works, and had a private railway connecting them. At present there are from 8,000 to 10,000 barrels of unfinished cement at the works, along with 800 barrels of the finished product.

The officers of the company are: President, Richard Piper; Secretary, Josiah Tolton; Treasurer, D. A. Wright; Constructing Engineer and Superintendent, E. Y. Jackson. It is the general opinion that the company's affairs will be straightened out and that work will be resumed in the spring.

The "Contract Record" has been favored with a copy of the annual report of the Department of Public Works of the Province of Saskatchewan for the year ending February, 29, 1908. In this publication municipal authorities, engineers and others will doubtless find much to interest them.

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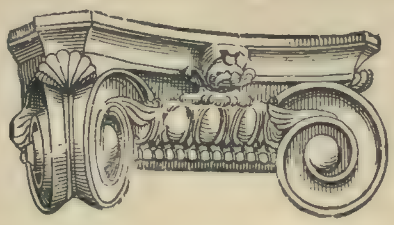

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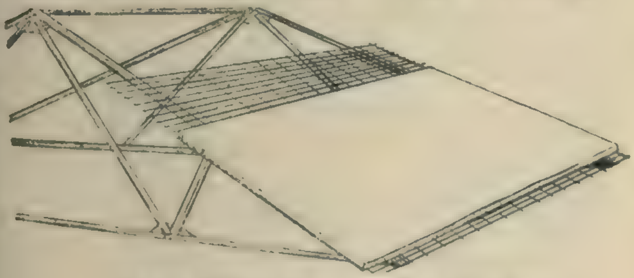

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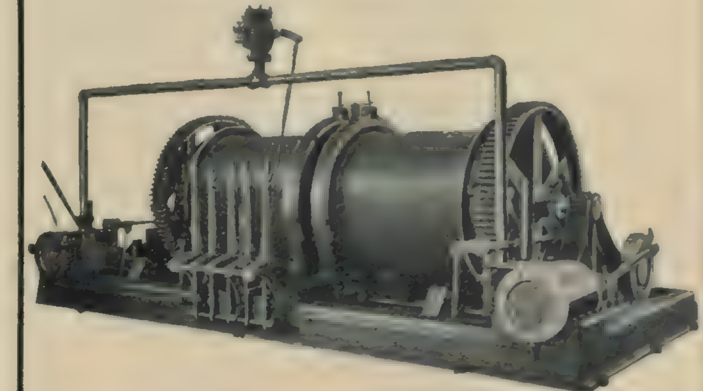

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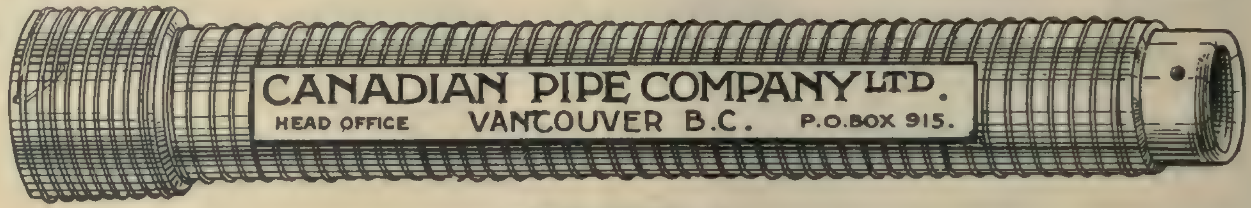

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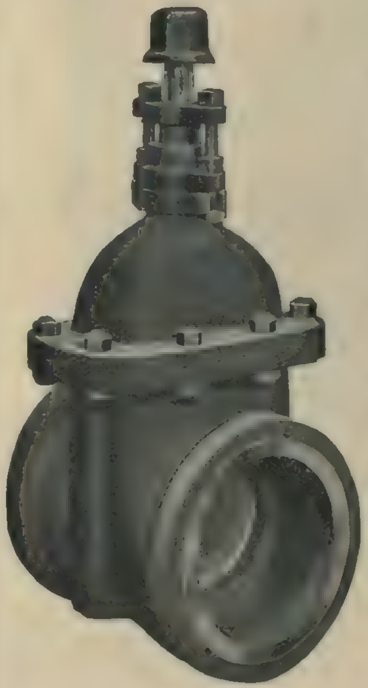

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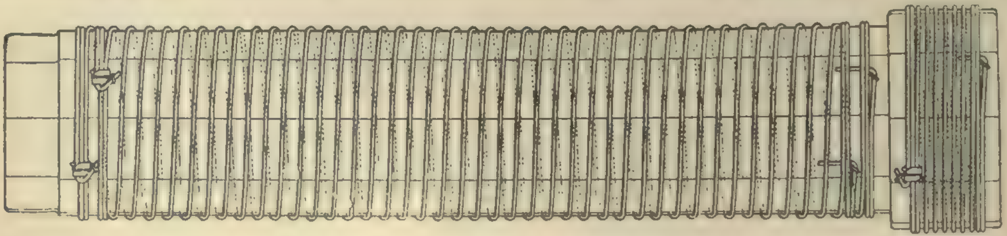

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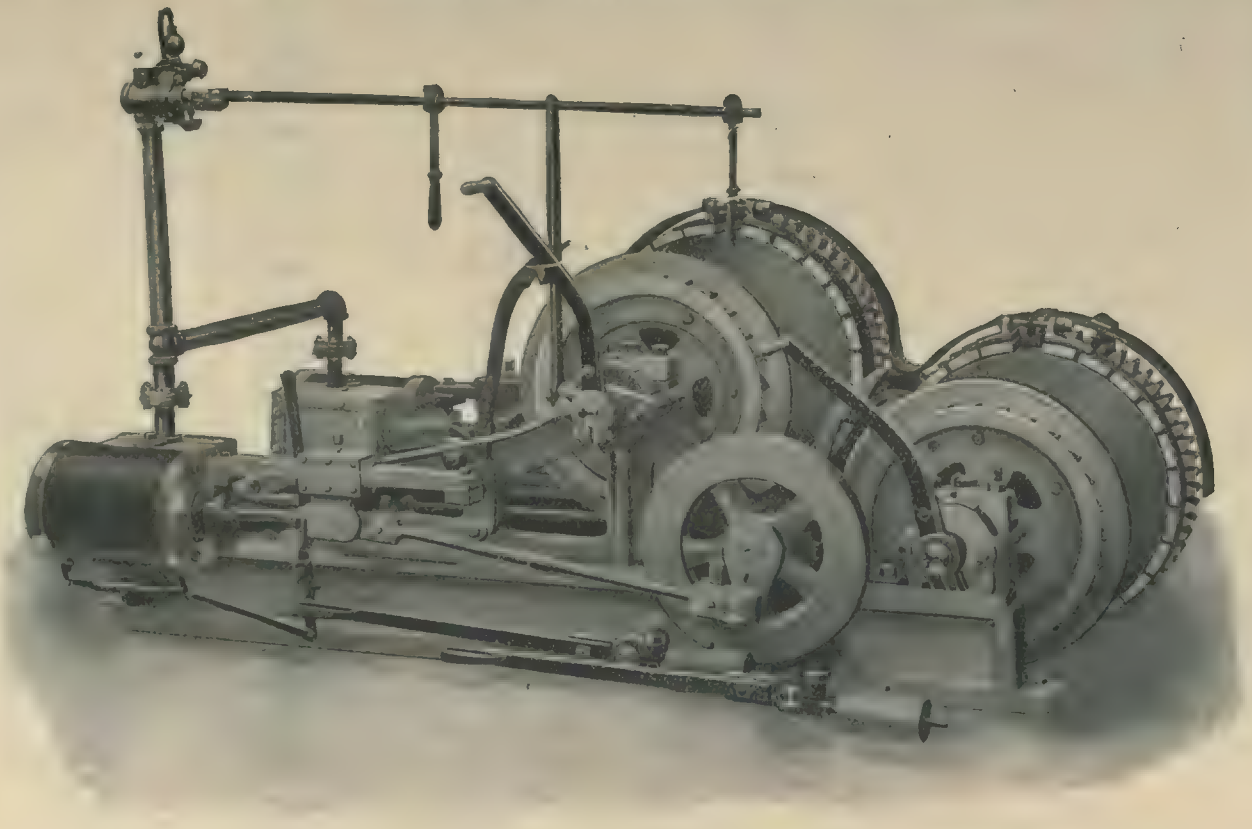

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Revelstoke, B.C.

Arrangements have been concluded between the city and T. F. Sinclair for the construction of the central section of the sewerage system in tne city. The question of what material will be used for pipes, whether it will be advisable to make them locally of cement, and other matters relating to filter beds, septic tanks, etc., will be taken up immediately. Work will be commenced about the middle of April.

Saskatoon, Sask.

Tenders will be received by J. H. Trusdale, City Clerk, until March 1st for materials for waterworks and sewerage works as follows: Cast iron pipe and specials, 280 tons; fire hydrants, gate valves, etc; sewer pipe, 20,000 feet; pumping machines. Specifications may be obtained at the office of the City Clerk, Saskatoon, or at the office of the Chief Engineer, Mr. Willis Chipman, 103 Bay street, Toronto.

Toronto, Ont.

The paving of portions of St. Patrick street, Anderson, Agnes and Wilton avenue with granite block is under consideration by the city. Estimated cost, $277,120. C. H. Rust, City Engineer.

W. A. Littlejohn, City Clerk, gives notice of the city's intention to carry out an extensive schedule of local improvements, improving pavements, concrete sidewalks, sewers and street extensions.

Railroads, Bridges and Wharves

Brandon, Man.

The Canadian Northern Railway will in the near future commence the erection of the proposed new depot and freight sheds. The depot when completed will cost approximately $45,000. The freight sheds will take up a block of 500 feet, occupying the site of the old sheds.

Edmonton, Alta.

Application has been made for the incorporation of the Southwest Alberta Railway Company, which will build a line from a point on the G. T. P. branch line between Calgary and Lethbridge, to Pincher Creek and the western boundary, a distance of about 100 miles.

Wallace McDonald, attorney, Edmonton, Alta., is applying for a charter for a company under the title of Alberta & Great Waterways, with power to build a railway from Edmonton to FortM cMurray, with several branch lines, in all about 300 miles of track, according to the route taken.

Lethbridge, Alta.

In addition to the Weyburn line, which the C. P. R. will construct this season, the company will lay a line from Lethbridge to connect the Macleod branch with the Calgary and Edmonton line, a little north of High River station.

Moose Jaw, Sask.

Notice is officially given that the Alberta Central Railway Company will apply to the Dominion Parliament at its coming session for a charter for the building of a railway line from a point on its main line at or near Red Deer, Alta., southerly and easterly to Moose Jaw.

Montreal, Que.

The Canadian Northern Railway will be opened between Montreal and Quebec by May 1, according to the Montreal "Gazette," when the new short line from Garneau Junction will become an accomplished fact. This announcement has been made by Guy Tombs, passenger and freight agent of the Canadian Northern. Mr. Tombs says that in the meantime important improvements will be made both to the Montreal and Quebec terminals. The railway, after leaving the city of Quebec, will pass over the St. Charles river and enter the new suburb of Limoilou, which, in all probability will be annexed to the city, and become the headquarters for the machine shops of the C. N. R. in that section of the province. Thence the road will reach Ste. Foye, Cap Rouge, St. Augustin, Point aux Tremles, Les Ecureuils, Cap Sante, Port Neuf, Deschambault, St. Casimir, Lachevrotiere, whence the track of the C. N. R. extends on to St. Prosper, St. Stanislas and to Garneau Junction, where the old line of the Canadian Northern is joined and followed to Joliette and Montreal at Moreau St. It will be 175 miles in length.

Niagara Falls, Ont.

It is stated that work upon the proposed trans-Niagara bridge will be commenced early this spring. Mr. Thos. Penney is President of the International Traction Company.

New Westminster, B.C.

The city has offered the Canadian Northern Railway a free site for the erection of shops and repair works.

Quebec, Que.

A deputation from this city waited upon Sir Wilfred Laurier in Ottawa last week to urge the immediate construction of a floating dock at Quebec and the construction of a permanent dock estimated to cost $2,500,000. The Premier promised to bring the matter before the Government at an early date. Sir Montague Allan, W. McPherson and representatives of the C. P. R. and other transportation interests were among the delegates.

Portage la Prairie, Man.

At a recent meeting of the Board of Trade a resolution in favor of the construction of an overhead bridge was drawn up, urging the City Council to take action to have the Railway Commission sit here to consider the situation.

Regina, Sask.

City Engineer Smith is submitting to the Board of Railway Commissioners plans for the proposed Broad street and Albert street subways. The estimated cost of each subway is $85,000. They will have a span of 100 feet and a width of 94 feet, with provision for six railway tracks.

The Saskatchewan Government, it is stated, will grant subsidies to the C. N. R. for branch lines in this province to the extent of $15,000 per mile for 500 miles of branches to be built in the province. These branches include the following lines: From a point near Battleford, westerly for 40 or more miles; from Dalmeny northerly and northwesterly for 45 miles or more; from Maryfield westerly for 135 miles; from Davidson westerly for 120 miles, and from Roche Perche northerly to this branch 25 miles; from Craven to Bracepeth, 45 miles.

St. Felicien, Que.

The bridge recently destroyed by fire will be rebuilt by the Government.

Temagami, Ont.

The T. & N. O. Ry. will rebuild their station, recently destroyed by fire.

Toronto, Ont.

Park Commissioner Wilson is asking for a sum of more than $20,000 for the construction of four concrete bridges at the Island.

The Ontario Dock Company have taken out a permit to erect a new dock on the Bay front, between the Argonaut Rowing Club and the Canoe Club, to cost $14,000.

Vancouver, B.C.

A deputation representing this city, North Vancouver and a number of suburban districts, waited upon the Provincial Government last week with a petition for the construction of a bridge across the Second Narrows of Burrard Inlet. The cost of a high level bridge without a span has been estimated by Engineer Cameron at $650,000, and of a low level bridge with a swing $50,000 less. The project was viewed favorably by Premier McBride, who promised the deputation that the matter would be considered in the estimates.

Weyburn, Sask.

It is definitely anonunced that the C. P. R. will construct a line from this town to Lethbridge, 400 miles distant, this season.

Public Buildings, Churches, Schools, etc.

Burnside, Man.

It is proposed to establish a consolidated rural school at this place for the districts of Rignold, Elsmith and Burnside. If the plans go through a modern school building will be erected.

Calgary, Alta.

Tenders will be received until February 15 for $9,000 six per cent. school debentures of Crescent High School District. Address Robert Michie, Box 1995, Calgary.

Coquitlam, B.C.

Tenders for the construction of the central building of the Provincial Asylum, which the Government propose locating on the Coquitlam river with the Fraser river, five miles from New Westminster, will be called for soon. The structure will cost between $260,000 and $270,000.

Kenora, Ont.
The Jarray & Melick council are considering the erection of a new school building.

London, Ont.
A deputation from the London Health Association will wait upon the council to ask for a grant for the erection of the proposed sanatorium. It is hoped that a substantial sum will be granted, but now that the association has obtained a charter, the sanatorium will be constructed in any case. More than $6,000 has already been subscribed to the fund.

The erection of a new mission church is under the contemplation of the trustees of the church of St. John the Evangelist. Work will probably be commenced in the spring.

Markham, Ont.
Tenders for the installation of hot water heating in the Markham post office close February 12th with N. Tessier, Secretary, Department Public Works, Ottawa.

Montreal, Que.
Plans have been prepared for an addition to the Italian Immigration Society's building on Osborne street. Mitchell & Creighton, architects.

It is stated that over $1,000,000 will be expended by the C. P. R. upon extensions and improvements at the Windsor street station and offices. The plans include an extension of the present building to St. Antoine street, with a front on Windsor street, after the same architectural design as the present buildings. The building will be utilized for office purposes, while the space in the centre will be used for train sheds. In addition the entrance on Osborne street will be re-modelled. Work upon these improvements will be started in the near future. Preparations are also being made for the extension of the Place Viger yards.

Sir Lomer Gouin recently stated that a new courthouse would be erected in this city in the near future.

New Westminster, B.C.
New Masonic headquarters will be erected in this city at a cost of $20,000.

Nelson, B.C.
C. H. Sayer, travelling secretary for the Y. M. C. A., has submitted plans for the establishment of a branch in this city and the erection of a new building.

Ottawa, Ont.
The Board of Control recommends the submission of a by-law to authorize the remodelling of the city hall.

Preston, Ont.
It is proposed to erect a Y. M. C. A. building in this town. Mr. J. G. Lorriman is interested in the movement.

Sydney, N.S.
St. Joseph's school was damaged by fire last week to the extent or $2,000.

Saskatoon, Sask.
Tenders for fittings, etc., for the Saskatoon public building close February 24th with N. Tessier, Secretary, Department Public Works, Ottawa.

Sherbrooke, Que.
The members of St. George's Church, Windsor Mills, Que., have decided to erect a new church from plans made by C. E. White, Sherbrooke, Que. The building will be of frame construction, interior to be finished in plain oak; exterior walls to be covered with cement over metallic laths; stained leaded glass, etc. The work is to start as soon as the season will permit.

Toronto, Ont.
Tenders addressed to W. McIntyre, Secretary-Treasurer, East Luther Agricultural Society, will be received until February 19th for the erection of a building about 165 feet by 78 feet on the park grounds, Grand Valley, to be used as an agricultural hall, also as a skating and curling rink. Plans and specifications may be seen at the office of the secretary.

The attention of the Board of Control has been called to the need of a new building for the House of Industry.

Plans have been prepared for the new building to be erected by the congregation of Christ church, Deer Park, at an estimated cost of $20,000. The new building will be of red brick with stone facings, and will have a seating capacity of about 600.

Owing to the difficulty of securing a suitable site for a new isolation hospital, Dr. Sheard, medical health officer, will recommend that the present isolation hospital in Riverdale be enlarged at a cost of $60,000.

The trustees of the Toronto General Hospital are considering the appointment of an expert to pass upon the plans for the new hospital prepared and submitted by Messrs. Darling and Pearson. The plans have been submitted calling for expenditures respectively of $1,350,000 and $1,210,000.

Plans for the Canada Bowling Club's new clubhouse, to be erected on Avenue road, are now ready. Estimated cost, $8,000.

Tenders close February 15th with Ellis & Connery, Manning Chambers, for a two-storey masonic temple to be erected on Annette street, West Toronto, for the West Toronto Masonic Temple, Limited. Estimated cost, $15,000.

Victoria, B.C.
Tenders for the hot water heating system at the Detention Building close February 11th with M. Tessier, Secretary, Department of Public Works, Ottawa.

A deputation from the Union of Municipalities recently waited upon the Provinical Government to ask for assistance in a project for the erection of a Home for the Aged. The matter is in abeyance.

Vancouver, B.C.
It is stated that the Great Northern Railway Company will shortly submit plans to the City Council for its proposed terminals in this city, to cost $3,000,000. J. M. Gruber, St. Paul, Minn., is general manager; A. H. Hogeland, St. Paul, is chief engineer.

The School Trustees have selected a site for the new high school building, for which $45,000 has been appropriated. The building is to be ready for occupancy by August 15th, and no time will be lost in securing plans and leting tenders.

The estimates for public schools this year include an item of $11,273.50 for necessary repairs.

Chief Chamberlin is recommending the erection of a new jail building, and failing this, extensive alterations to the present structure.

The Western Club will erect a new club building at the corner of Hastings and Hornby streets at a cost of $40,000. Mr. Lambert Bond is President of the Western Club.

It is stated that a new hospital is contemplated by the Salvation Army.

Winnipeg, Man.
Plans for a new racket court to be erected on Donald street at a cost of $6,000, have been prepared by J. A. Harvey, architect, Manning Chambers, Toronto.

Westville, N.S.
Tenders for the supply of fittings, etc., for the post office at this place close February 22nd with N. Tessier, Secretary, Department Public Works, Ottawa.

AWARDED.

Montreal, Que.
H. Andrews & Company, this city, have obtained the sub-contract for plastering for the new wing of the Alexandria hospital, from Messrs. Reid, MacGregor & Reid, the general contractors. E. & W. S. Maxwell, architects.

Residences

Paradise, N.S.
Tenders for the erection of a parsonage and stable at this place are invited until February 13th by F. W. Bishop, secretary of the building committee.

Montreal, Que.
A company to be capitalized at $250,000 is being promoted by G. W. Badgley, this city, for the purpose of erecting an apartment house on the west of Cote des Neiges road, above Sherbrooke street. The building will be known as the "Seaforth"; will have frontage of 220 feet, and contain forty-five apartments.

Theo. Doust, architect, 103 St. Francois Xavier street, has prepared plans for a residence to be erected on McCulloch avenue for Mr. Jos. Gravel. The building will be constructed of stone and brick, and cost $35,000.

Mr. Wm. Lyall, of Peter Lyall & Sons, general contractors, Board of Trade Building, has purchased a large block of land on Western avenue, Notre Dame de Grace, on which he will erect twenty semi-detached residences in the spring.

Chas. Bernier, architect, has prepared plans for the erection of a residence in Hochelaga for Mr. Dufresne.

St. John, N.B.
Councillor Long, of Fairville, is having plans prepared for the erection of a concrete house near the city. Construction will be commenced in the spring.

Toronto, Ont.
Plans for the new apartment house to be erected on Gerrard street east, opposite the Normal School, have been completed by J. A. Harvey, architect, Manning Chambers. The building will be of brick construction with stone foundation, hot water heating, electric lighting, etc. Estimated cost, $40,000.

Recent building permits include: Geo. Rennie, two pair semi-detached two storey brick dwellings, Lucas street, $9,000; G. and F. Paul, two storey brick dwelling, Stonehouse crescent, $1,800; E. Howell, pair semi-detached two storey brick dwellings, Yarmouth road, $4,000; H. F. Sanders, two storey brick dwelling, Galley avenue, $2,500; Wm. Tyley, two storey and attic brick dwelling, Bowden avenue, $2,800; Wm. Hodgkinson, three attic two storey roughcast dwellings, brick fronts, near First avenue, on the west side of West avenue, $5,000; W. A. Clatworth, two storey brick dwelling, near Vanhorne, on Delaware avenue, $2,800; J. L. Hughes, two storey brick dwelling, Galley avenue, $2,000; G. F. Bailey, two storey and attic brick dwelling, near Indian road, on Thorold avenue, $4,000; W. K. Shaw, two storey and attic brick dwelling, corner of Indian road and Park place, $3,500; C. A. Goldman, two storey frame dwelling, near Breakwater, Centre Island, $2,800; R. McLeod, pair semi-detached two storey and attic brick dwellings, St. Clair avenue, $6,000; J. S. Lougheed, two storey and attic brick dwelling, between Roncesvalles and Sorauren avenues, on south side of Lucas street, $2,800; T. W. Knight, pair semi-detached two storey and attic brick fronts, roughcast dwellings, Knox avenue, $3,000; A. T. East, two storey brick dwelling, corner Harvard avenue and Callendar street, $3,000; H. H. LeDrew, pair semi-detached two storey brick dwellings, Westmoreland avenue, $4,000; Mrs. E. Ellis, two storey brick dwelling, Geoffrey avenue, $3,000; John Willmot, two and a half storey dwelling, Woodlawn avenue, $5,400; A. E. Peglar, pair semi-detached two storey roughcast dwellings, brick fronts, Frizzell avenue, $2,000; J. T. and H. Hutson, two-storey and attic brick dwelling, near St. Clair avenue, on the east side of Poplar Plains road, $5,500.

J. A. MacKenzie, architect, 32 Adelaide street east, has prepared plans for a store and dwelling to be erected at the corner of Broadview and Gerrard streets, for Mr. F. A. Jacobs. Estimated cost, $6,000.

Geo. R. Harper, architect, 61 Yonge street Arcade, has prepared plans for a $6,000 residence to be erected on Glencairn avenue, west of Yonge street, North Toronto, for Mrs. Edith L. Reade, Merton avenue.

G. B. Harper, architect, has prepared plans for three attached dwellings to be erected on Bartlett avenue, near Hallam street, for Mr. H. E. Bell. Messrs. Tait & Angus, 164 Macpherson avenue, have the general contract. Estimated cost, $8,500.

Geo. R. Harper, architect, has prepared plans for two 2 1-2 storey residences to be erected on Major street, south of Lowther avenue, for Mr. E. M. Shildrick, at a cost of $8,000.

Geo. R. Harper, architect, this city, has prepared plans for a 2 storey residence to be erected on Pearson avenue, east of Roncesvalles avenue, for Mr. H. I. Clarkson.

P. H. Finney, architect, this city, has prepared plans for two detached 3 1-2 storey dwellings to be erected on St. George street, near Dupont street, for Wilkins & Company. The structures will cost $7,000.

J. M. Cowan, architect, this city, has prepared plans for a $3,500 dwelling to be erected on Kendall avenue, near Wills street, for Mr. James Crang.

J. M. Cowan, architect, has prepared plans for a 2 1-2 storey store and dwelling to be erected on Bloor street, near Lansdowne avenue, at a cost of $4,000.

J. M. Cowan, architect, has prepared plans for an apartment building to be erected on McCaul street at a cost of $10,000.

Jas. L. Havill, architect, Mail Building, has prepared plans for a 2 1-2 storey dwelling to be erected on Binscarth road for Mr. H. Bishopric.

Deeth & Son, 44 Gore avenue, will erect two pairs of semi-detached brick dwellings on Dufferin street, near Fisher street, at a cost of $9,000. They will be 2 1-2 storeys, of brick construction, with stone foundation.

Messrs. Deeth & Son, this city, will erect two semi-detached brick dwellings on north side of Fisher street, near Dufferin street, at a cost of $4,000.

F. Wilkins & Company, 70 Wellesley street, will erect two detached dwellings on St. George street, near Dupont. The buildings will be of brick construction, with stone foundation. Estimate dcost, $7,000.

R. E. MacDonagh, 148 Spadina avenue, will erect a pair of 2 1-2 storey semi-detached brick dwellings on the east side of Grace street, near Bloor street, at a cost of $5,000.

J. S. Case, 141 Geoffrey street, will erect two detached 2 1-2 storey brick dwellings, on Roncesvalles avenue, near Geoffrey street, at a cost of $8,000.

Leonard Foulds, architect, 43 Victoria street, is preparing plans for a 2 1-2 storey residence to be erected on Palmerston boulevard, near College street, at a cost of $5,000.

J. W. Siddall, architect, 75 Yonge street, has prepared plans for a 2 1-2 storey dwelling to be erected on Indian road, near Ridout street, for Mr. B. W. Barton.

J. Hunt Stanford, architect, 34 Victoria street, has completed plans for a 2 1-2 storey dwelling to be erected on Palmerston boulevard for Mr. E. Ferris, 292 Victoria street. It will cost $4,000, and will be of brick construction, with stone foundation.

J. Hunt Stanford, architect, has prepared plans for a 2 1-2 storey residence to be erected on Poplar Plains road, near Lynwood avenue, for Mr. H. Hutson. Estimated cost, $5,000.

Welland, Ont.

Mr. Burgar will erect three houses on his property next to the Methodist Church this spring.

AWARDED.

Brockville, Ont.

James Frederick has been awarded the contract for a large summer home to be erected on Jarvis Point for Mr. Geo: C. Boldt, of the Waldorf Astoria, New York City. The building will be three storeys in height, 88 x 51 feet.

Montreal, Que.

Eric Mann, architect, has awarded the following contracts for the construction of nine flats on Pine avenue for Mr. David Sperber: Brick work, A. E. Wand & Company; plumbing and heating, Greenberg & Company.

Jas. E. Adamson, architect, has awarded the following contracts in connection with the erection of a residence at Crescent street for Mr. Chas. Skelton: General contract, Jackson & Company; masonry, Jas. Young; plumbing, Alex. MacKay & Company.

E. &. W. S. Maxwell, 6 Beaver Hall square, have awarded to Jas. Morison the contract for the brick and masonry on a residence on Drummond street for Mr. R. B. Angus.

E. & W. S. Maxwell have awarded to John Quinlan & Company the general contract for the erection of a residence on Peel street for Mr. C. F. Smith.

J. A. Karch, architect, has awarded to Sparrow & McNeil, Coristine Building, the contract for excavation and masonry work for the presbytery to be erected on St. Antoine street for the St. Thomas Aquinas Church.

Chas. Bernier, architect, has awarded to Eiendeau & Soly the contracts for roofing, cornice work, plumbing, gas and electric work, and hot water heating, for three tenement houses to be erected on Park avenue for Napoleon Deslauriers.

Toronto, Ont.

Contracts for the new residence to be erected on Binscarth road for Messrs. Simm and Smart at a cost of $5,000, have been awarded as follows: Masonry, Chas. Wood; plastering, W. J. Haddock; plumbing, heating and electric wiring, J. R. Seager. Architect, J. H. Galloway, 77 Victoria street.

Elgie & Page have been awarded the contract for the masonry work in the construction of a two storey residence on Roxborough street for J. A. McEvoy. T. B. Manual was awarded the carpentry contract. Estimated cost, $6,500. Architect, C. J. Gibson, 75 Yonge street.

Contracts have been awarded as follows for a pair of dwellings to be erected on Major street, near Lowther avenue, for Messrs. Almond & Page: Painting and glazing, A. Longbottom; roofing and tinsmithing, A. Ryan; plumbing and heating, Chas. Tyler. Architect, J. Hunt Stanford, 34 Yonge street Arcade.

Business Buildings and Industrial Plants

Belleville, Ont.

The city have received a proposition from the Burrell Rock Drill Company, Limited, for the erection of new buildings and plant on consideration of exemption from taxes and free power.

Brandon, Man.

J. H. Griffin, general inspector and traffic agent of the Great Northern Railway, states that an elevator will be erected in Brandon early next season.

Campbellton, N.B.

It is stated that the Royal Bank are contemplating the erection of a new building.

Dartmouth, N.S.

The Halifax Fish Company's factory at this place was destroyed by fire last week.

Gananoque, Ont.

The buildings of W. Y. Boyd, C. Sine, Corrigan & Company, W. G. Rogers and others were damaged by fire last week at a total loss of nearly $100,000.

Grand Forks, B.C.

The British Columbia Telephone Company have completed plans for a new office building. Work will be commenced in the spring.

Hamilton, Ont.

A 3 storey addition to their works will be erected by the Meriden Brittania Company.

Chadwick Bros. are having plans prepared for the construction of an extension to their plant.

Kingston, Ont.

The ratepayers have approved a by-law granting a bonus of $10,000 to the Wormwith Piano Company.

London, Ont.

It is stated that George White & Sons are contemplating the extension of their plant.

The provincial legislature will be petitioned to empower the city to issue $100,000 debentures for the purchase of factory sites.

Moncton, N.B.
The hotel Brunswick was badly damaged by fire last week.

Montreal, Que.
The hotel Berthelet and two dwellings at Back River, near this city, were destroyed by fire last week at a total estimated loss of $20,000.

Property has been purchased by the National Bank for the erection of a large new building. The present bank will also be considerably extended.

It is reported that the H. A. Wilder Company will erect a building on the site purchased by them on the southeast corner of Bleury and Berthelet streets.

Plans for the Quebec Bank's new building, to be erected at the corner of Atwater avenue and Notre Dame street, have been completed by Cox & Amo, architects.

The building at 326 West Craig street, occupied by F. Thomson & Company, contracting electrical engineers, was destroyed by fire last week at a building loss of about $4,000.

A. F. Dunlop, architect, Lindsay Building, has prepared plans for the proposed extension of S. Carsley's building on St. Catherine street west, now occupied by the W. H. Scroggie Company.

Messrs. Freeman's, who recently purchased Polequin's restaurant on St. Francois Xavier street, will thoroughly remodel the premises and convert the large wine cellars in the basement into a palm garden.

The John D. Duncan Company, this city, has purchased land adjoining their present premises, on which they will next spring erect a building. MacVicar & Heriot, architects, 104 Union avenue, will prepare the plans.

New Westwinster, B.C.
Plans have been prepared by E. G. W. Tait, architect, for a brick block to be erected at the corner of Church and Columbia streets for Berrett & Deane, real estate brokers. The block will consist of stores, with rooms and offices above, and will cost approximately $50,000.

North Sydney, N.S.
The large building at the corner of Queen and Lorne streets, owned by James Walsh, was destroyed by fire last week.

North Vancouver, B.C.
It is stated that plans are being prepared for a new building for the Bank of Hamilton.

Ottawa, Ont.
It was announced by Mr. Wainwright, of the G. T. R., last week, that work upon the new hotel to be erected by the company on Major Hill Park will be commenced on May 1st.

Parry Sound, Ont.
The Oddfellows' Temple and buildings of Thos. and Joseph Bruce were damaged by fire on February 7th.

Pembroke, Ont.
Plans are now ready for the new bank building to be erected here for Mrs. J. H. Munro. Estimated cost, $12,000. C. P. Meredith, Ottawa, architect.

Peterborough, Ont.
Mr. Brooks, proprietor of the South Beach summer resort at Clear Lake, will shortly erect an addition of twenty rooms to his hotel.

Prince Albert, Sask.
Mr. R. T. Goodfellow has had plans prepared for a large brick block, adjoining his present block at the corner of River street and Central. Estimated cost, $15,000.

Schreiber, Ont.
Properties owned by H. H. Parliament, Schreiber Drug Company, Queen's Hotel, F. Armstrong and others were damaged by fire last week.

Three Rivers, Que.
Plans have been prepared for the new building to be erected here by the National Bank. Daoust & Lafont, architects.

Toronto, Ont.
Heintzman & Company, Limited, have purchased a site for the construction of an extension of their factory.

A 2 storey brick store and dwelling will be erected by Robert Wright on Sorauren avenue at a cost of $2,700.

A 3 storey brick warehouse will be erected by J. Stevens & Son on Wellington street west at a cost of $10,000.

Gordon McKay & Company's dry goods warehouse was damaged last week by the bursting of pipes in the sprinkler system.

The Nasmith Company have purchased the property immediately south of 152 Bay street, for the erection of a large restaurant.

Edward Cronyn & Company have purchased number 90 Bay street, and will eventually erect a new building at a cost of about $40,000.

The I. O. O. F. has purchased a site on College street for the erection of a new association building, for which plans are now being prepared.

The Massey-Harris Company have taken out a permit for the erection of a 3 storey brick addition to their offices on King street west. Estimated cost, $3,000.

A permit has been granted to the Construction Paving Company for a 2 storey brick and galvanized iron asphalt plant on Dupont street. Estimated cost, $3,000.

C. A. Larkin has obtained a permit to erect a one-storey frame and iron planing mill and boiler house at Royce and Campbell avenues at an estimated cost of $3,500.

Harton Walker, real estate agent, reports the sale of 177, 178 and 181 King street west to Major E. G. Peuchen, who will erect a large office building for the Standard Chemical Company.

The residence at the northeast corner of Spadina avenue and Phoebe street, formerly the property of Dr. Stewart, is stated to have been sold to an American firm for the erection of a large warehouse building.

The Ontario Dock Company have obtained a permit for the construction of a 1 storey frame freight shed, covered with corrugated iron, on the dock between the Argonaut Rowing Club and the Toronto Canoe Club. Estimated cost, $14,000.

Victoria, B.C.
The British American Trust Company, Limited, have purchased the Redfern block on Government street and will erect a large office building on the site.

Vancouver, B.C.
Dr. Good, of Winnipeg, has purchased the site of the Maple Leaf Theatre at this place, on which he will erect a modern building.

A syndicate known as "The Exchange Building, Limited," has been incorporated for the purpose of erecting a large office building on Hastings street. A high speed elevator service, electric light, steam heating, lavatories, vacuum cleaning systems, etc., for each room will be installed. Mr. John S. Heyler, 518 Hastings street, is the architect. Mr. John Kendall, of Kendall & Sewell, Crown & Wilson Block, is secretary for the incorporation.

Wetaskiwin, Alta.
The Albert Opera House, Pearson's livery stable, Buckhall's general store and the Alberta Hotel were damaged by fire last week at a total loss of $20,000.

Winnipeg, Man.
A permit has been issued to J. S. Wilbert for alterations to his warehouse on Gordon avenue at a cost of $3,000.

Mackenzie & Mann have obtained a permit for the erection of a warehouse at the C. N. R. yards at a cost of $3,500.

The Great West Saddlery Company will erect a new wholesale house on James street. The building will be of brick and stone construction, with stone foundation, and will cover a space of 28 x 100 feet. It will be 4 storeys high and will cost about $20,000. E. F. Hutchings is President of the Great West Saddlery Company.

Woodstock, Ont.
Robert Richardi, of Arnprior, Ont., is contemplating the removal of his clothes pin factory to this city, and the erection of a factory.

At the recent annual meeting of the Board of Trade the secretary read a communication from the Russell Harvesting Machine Company, Limited, in which a plan was submitted for the erection of a large factory in this city. The citizens are asked to take up $25,000 of stock, and the company wants free light, water and taxes for ten years or a free site. The company was recently organized to manufacture grain shockers.

AWARDED.

Toronto, Ont.
Wm. Williamson, this city, has been awarded the general contract for a pair of 2 storey stores to be erected on the corner of Queen and Herbert streets for W. H. Coon.

Power Plants, Electricity and Telephones

Brockville, Ont.
M. W. Beach, of Iroquois, accompanied by Mr. Gilmour, electrical engineer, of Toronto, was in town last week in furtherance of a plan to transmit power from Iroquois to Brockville. Mr. Beach wants to build a transmission line and to supply the water department with power. The line would pass through Prescott and Cardinal, and negotiations are being conducted with these places. No decision has yet been arrived at by the local Board of Trade.

Kamloops, B.C.
The council are considering the extension of the power plant.

Middleton, N.S.
The people of Middleton, in the Annapolis Valley, are considering the question of a lighting plant for the town. There is a small water fall of about twenty-five feet on the Annapolis river at Lawrencetown, about six miles below Middleton, from which they could develop about three hundred horse-power or more. They propose acquiring this, and building a power house, transmitting the power to Middleton. If Lawrencetown will fall in with the proposition, they can also secure their lighting from this source. At the present time, there are no electric lights in either of

these towns. If the money can be raised for the purpose, it is planned to carry this proposition out in the near future.

Peterborough, Ont.

W. Kennedy, jr., consulting engineer, Montreal, has submitted to the Water Commissioners plans for the proposed new dam and power house. The plans call for a pumping plant of one new unit of three million imperial gallons capacity per 24 hours when pumping against 115 pounds pressure in the air vessel, also the two 2 1-4 million gallons each pumping units in the present pump house. The new unit will be first installed and set to work, after which the old units will be repaired, if necessary, and removed to the new pumping station, thus providing an uninterrupted water supply to the town. The pumping capacity will then be 7 1-2 million gallons per day with provision in the pump house for an additional unit of 3 million imperial gallons per day, thus ultimately providing for 10 1-2 millions per day. The estimated cost of the dam, with bridge, power house, intake cribs, 7,500,000 gallons capacity pumping plant, installed complete, with suction and discharge pipes, is $117,000.

Tilbury, Ont.

The Tilbury Telephone Company, Limited, have obtained a franchise from the council for a period of twenty years.

Tranquille, B.C.

Mr. C. Deutcher, consulting engineer, Vancouver, has been engaged by the management of the sanatorium to report on the most efficient scheme for power supply at the institution.

Woodstock, Ont.

Plans for the proposed radial railway from this city to Guelph, a distance of fifty miles, were recently outlined by Mr. W. A. Bugg, of the Woodstock-Guelph Railway Company. The estimated cost was placed at $15,000 per mile.

AWARDED.

Winnipeg, Man.

The Winnipeg Electric Railway Company have awarded to J. A. Dawson, of Montreal, a contract for 30 brill steel trucks for new cars now in course of construction.

Miscellaneous

Brantford, Ont.

Tenders addressed to John Moffat, Chairman of the Board of Works, care of the City Clerk, will be received until February 23rd for supplies of cement, sewer pipe and paving brick required by the city for 1909. Specifications may be obtained of the City Engineer, Mr. T. Harry Jones.

Calgary, Man.

Tenders will be received by the City Commissioners until March 1st for general hardware supplies. Specifications and bills of quantities may be obtained from the City Comptroller.

Nanaimo, B.C.

A movement is on foot to have a Government survey made of Nanaimo harbor, to be followed by extensive dredging. The estimated cost of the work has been placed at $100,000.

Ottawa, Ont.

Tenders addressed to W. W. Cory, Deputy Minister of the Interior, will be received until February 22nd for 144 cedar posts and 113,000 feet best quality spruce timber of various dimensions up to 6 inch by 6 inch and 27 feet long, to be supplied not later than April 8th. Specifications may be seen at the office of the Chief Astronomer, Dominion Observatory, or will be sent by mail on application.

Simcoe, Ont.

Tenders addressed to Frank Reid, Town Treasurer, will be received until February 18th for the purchase of $6,000 five per cent. 25-year waterworks debentures, and $4,800 five per cent. 20-year local improvement debentures, and $10,500 four and a half per cent. 30-year consolidation of debt debentures.

Toronto, Ont.

The Ontario Railway Board has ordered the Toronto & York Radial Railway Company to carry out the recommendation that drains be placed beneath the tracks at specified points, and that all switches, turnouts and tracks be macadamized, the work to be done within four months by the railway company.

Wadena, Sask.

Tenders addressed to J. Harvey Hearn, Secretary-Treasurer, will be received until February 15th for $3,850 six per cent. 10-year debentures of this village.

Winnipeg, Man.

Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until February 24th for supply of asphalt, about 2,500 to 3,500 tons, for street paving. Specifications may be obtained from the City Engineer, H. N. Ruttan.

AWARDED.

Edmonton, Alta.

$254,000, four and one half per cent. local improvement debentures of this city have been awarded to W. A. MacKenzie & Company.

London, Ont.

G. A. Stimson & Company, Toronto, have been awarded an issue of $76,680 bonds of this city.

Portage la Prairie, Man.

At a recent meeting of the Parks Board contracts were awarded to Wm. Carr, C. P. Wright, Manitoba Iron Works and H. Ogletree for labor, material and land required in the Crescent Lake project. C. P. Wright's tender is for excavating the canal and building the earth dam at a cost of 15 cents per yard. It is estimated to cost somewhat less than $4,000. Wm. Carr will build the needle dam, bulkhead and pay cartage on all materials for $14,000. Steel and iron required for the needle dam will be supplied by the Manitoba Iron Works at a contract price of $534. It is now estimated that the entire cost of the work, including engineer's fees, will not exceed $26,000.

New Companies

Ben Hur Truck Company, Limited, Hamilton, Ont., incorporated, capital, $20,000. Incorporators, F. R. Close, G. J. Henderson, W. M. Findlay, T. A. Henderson, C. H. Snyder, A. B. Crawford and C. E. Thomson, all of Hamilton, Ont.

James Peat & Son, Limited, Petrolea, Ont., incorporated as drilling contractors, capital, $40,000. Incorporators, James and J. A. Peat, both of Petrolea, Ont.; G. A. Peat, of Lethbridge, Alta.; O. D. Peat and H. S. Lees, both of Hamilton, Ont.

Canadian Vault Company, Limited, Toronto, Ont., incorporated to manufacture steel reinforced water-proof cement burial vaults, capital, $50,000. Incorporators, E. C. Davis, O. H. Holderer and S. W. Burns, all of Toronto.

Cobalt Hydraulic Car Company, Limited, Toronto, Ont., incorporated, capital $2,000,000. Incorporators, J. B. Holden, G. A. Grover, J. I. Grover, F. J. Apjohn and others, all of Toronto.

Niagara and Ontario Construction Company, Limited, Toronto, Ont., incorporated, capital $40,000. Incorporators, E. Hendrick, B. Furre, A. P. Ball, all of New York City, and Hugh Murray and John Poag, both of Hamilton, Ont.

Fraser Bryson Lumber Company, Limited, Ottawa, Ont., incorporated, capital, $40,000. Incorporators, J. B. Fraser, W. A. Fraser, J. A. Storey and H. N. Fraser, all of Ottawa, Ont., and others.

Watt Hose & Pipe Coupling Manufacturing Company, Limited, Woodstock, Ont., incorporated, capital $100,000. Incorporators, W. J. Watt, G. E. Phillips, J. A. MacDonald, H. J. Leas and J. Maycock, all of Woodstock, Ont.

Rudd Paper Box Company, Limited, Toronto, Ont., incorporated, capital $60,000. Incorporators, A. E. Rudd, T. H. Butler and others, all of Toronto.

Bartram Bros., Limited, Ottawa, Ont., incorporated to manufacture lumber, capital $20,000. Incorporators, W. B. Bartram and A. B. Bartram, both of Ottawa; J. B. Bartram, C. B. Bartram, and L. A. Neil, all of Toronto.

Producer Gas Construction Company, Limited, Toronto, Ont., incorporated, capital $200,000. Incorporators, H. R. Ivor, J. H. Harvey, J. R. Starr and others, all of Toronto.

Ayr Rural Telephone Company, Limited, Ayr, Ont., incorporated, capital $10,000. Incorporators, W. A. Ramsay, W. A. Woolner, A. E. Watson, W. Manson and G. D. Black, all of Ayr, Ont.

Hespeler Machinery Company, Limited, Hespeler, Ont., incorporated, capital, $100,000. Incorporators, W. G. Chater, Hespeler, Ont.; T. F. Campbell, M. A. Secord, A. Wilson and others, all of Galt.

Business Notes

The Colville Electric Company has assigned to E. R. C. Clarkson.

Lefaivre & Taschereau have been appointed curators in the affairs of J. B. Rheault, lumber manufacturer, Lac Aux Sable, Que.

Dussault & Powers, contractors, Levis, Que., have dissolved partnership. A new firm has registered under the same style, composed of Thos. Powers and L. Dussault.

Messrs. Grose & Walker, Winnipeg, have taken over the agency in the west for the Herringbone Lath, which was formerly handled by C. W. Noble, who is now manager of the Metal Shingle & Siding Company, of Preston, with head office in Toronto.

The committee of the Montreal City Council report in favor of seeking legislation that will empower them to buy out the Montreal Water & Power Company. The price asked by the company is about four and one-half millions.

City Engineer Rust, Toronto, has appointed Mr. W. Hollingworth, assistant engineer on the city's main drainage works. He will have charge of section three of the trunk sewer.

Tenders and For Sale Department

Notice to Contractors

The Alvinston School Board contemplates installing either a

Hot Water or Steam System of Heating

for the use of the Alvinston School. Tenderers will please send plans and specifications when tendering. Board meets the first Friday of every month.

ALEX. M. PHAIL,
Secretary School Board,
6 Alvinston, Ont.

City of Saskatoon

Province of Saskatchewan

Tenders Wanted

Sealed tenders will be received by the City Clerk until

8 p.m. on Monday, March 1st, 1909

for certain materials for Water Works and Sewerage Works, as follows:

Contract "D"—Cast Iron Pipes and Specials, 280 tons
" "E"—Fire Hydrants, Gate Valves, etc
" "F"—Sewer Pipes, 20,000 feet
" "G"—Pumping Machinery

Plans and specifications may be seen at the office of the Chief Engineer, 103 Bay Street, Toronto, or at the office of the City Clerk, Saskatoon.

WM. HOPKINS, Esq.,
Mayor,
Saskatoon, Sask.

J. H. TRUSDALE, Esq.,
City Clerk
Saskatoon, Sask.

WILLIS CHIPMAN, C.E., Chief Engineer,
103 Bay Street, Toronto, Ont. 6

City of Lethbridge, Alberta, Canada

Tenders for

Municipal Power Plant

Specifications, drawings and form of tender may be obtained from the Secretary-Treasurer, City of Lethbridge, Alberta, on and after the FIFTEENTH DAY OF JANUARY, 1909. The following are the sections issued:

A. Boilers and Accessories.
B. Economizer.
C. Feed Pumps.
D. Mechanical Draft.
E. Pipe Work and Valves.
F. Steam Turbine Generator.
G. Steam Engine Generator.
H. Re-erection of Steam Engine.
I. Condensing Sets.
J. Crane.
K. Switchboards, &c.
L. Motor Generators and Transformers.
M. Buildings, Steel Work, Etc.

Tenders on any or all of the above sections or any combination of the above sections will be received.

Tenders to be enclosed in a sealed envelope addressed "Tenders for Electric Plant" and to be delivered to the undersigned at the City Hall, Lethbridge, on or before the 1st DAY OF MARCH, 1909, and to remain open for acceptance for two (2) calendar months from that date.

Each tender must be accompanied by a certified cheque payable to the Secretary-Treasurer, of the City of Lethbridge, for 10 % (ten per cent.) of the amount of the tender, which will be returned to the tenderer, unless he fail to enter into contract for the work at the rate stated in the tender.

Plans and specifications may also be seen at the offices of Messrs. Smith, Kerry & Chace, Confederation Life Building, Toronto, Ontario, and the Carnegie Public Library Building, Winnipeg, Manitoba. The lowest or any tender not necessarily accepted.

A deposit of $10 (ten dollars) will be required for use of plans and specifications, which will be returned upon letting of contracts.

GEO. W. ROBINSON,
Secretary-Treasurer.

City of Calgary

Tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned, marked "Tender for Boiler and Generator," until the 18th DAY OF FEBRUARY, NEXT, at 12 o'clock noon, for supplying to the City the following:

3 Water Tube Boilers equivalent to 1,000 H.P., with piping and induced draft system for 2,500 H.P.

Also 1 500 K.W. Generator connected to a 750 H.P. High Speed Engine for Railway System, with condensor, switchboard, etc.

A certified check on a chartered bank in Canada for 2½ per cent. of the amount must accompany each tender—Separate offers may be made for any of the items set out herein.

Plans and specifications can be had on application to the City Engineer, Calgary, Alta.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary, January 20th, 1909. 7

City of Brantford

Tenders for Cement, Sewer Pipe and Paving Brick

Sealed tenders addressed to John Moffat, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock noon on

Tuesday, February 23rd, 1909

for the above supplies required by the City of Brantford, during 1909.

Specifications may be seen, and instructions to bidders and forms of tender obtained on application to the City Engineer.

Each teader must be accompanied by a marked cheque payable to the order of the City Treasurer for the amount called for in the form of tender.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.

City Hall, Brantford, Feb. 8, 1909. 7

City of Calgary

Tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned marked "Tender for Street Railway Material," until the 18th DAY OF FEBRUARY NEXT, 12 o'clock noon, for supplying to the City the following:

Covering approximately:
397 long tons No. 80 A. S. C. E. steel rails
746 " No. 60 " "
Together with certain special work, also spikes, bonds, tie plates.
Angle irons, track bolts, ties, etc.
12 standard street railway cars.
One street railway sprinkler.
" " " sweeper.

OVERHEAD CONSTRUCTION.

Steel span wire poles 30' and 35 three sections.
Cedar poles.
12.5 miles of 2.0 trolley wire.
10.2 miles of 3.0 feed wire.
Span wire.
Hangers, insulators, and conical strain insulators.
Ears.
Cross-overs and trolley frogs.

Bids will be received upon the entire schedule or any item of the same. A marked cheque covering 5 per cent up to $10,000 and 2½ per cent over and above this sum of the amount bid will be required to accompany each and every tender.

Full particulars and specifications will be supplied at the City Engineer's Office.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary, January 20th, 1909.

Agent Wanted

or the best line of Concrete Machinery in the world. A splendid opportunity for an aggressive young firm or individual. Box 136, CONTRACT RECORD, Toronto. tf

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ARCHITECTS

Architectural Designer, ten years with high class work seeks opportunity as partner or similar proposition. Box 138, CONTRACT RECORD, Toronto. 6

Tenders Wanted

Sealed tenders will be received by the undersigned up to NOON, MONDAY, MARCH 1st, for General Hardware supplied as under:

Electrical, Rope, Twine and Chains, Paint, etc., Iron, Steel, etc., General Hardware, Tools, Lead Pipe and Brass, Miscellaneous, Grey Iron Castings, Bolts, Nuts, Washers, Nails and Screws, Brick and Clay, Gas Pipe and Fittings, Pump Packing, Hose and Rubber Goods, Horse Shoe Material, Coal and Coke, Oil, Waste, etc., Lamps and Lanterns.

Specifications and bills of quantities can be had at the Office of the City Comptroller.

The lowest or any tender not necessarily accepted.

CITY COMMISSIONERS.

City Hall, Calgary, February 2nd, 1909. 8

Tenders for Supply of Asphalt

Sealed tenders, addressed to the Chairman Board of Control for the supply of from 2,500 to 3,500 tons of Asphalt for street paving for the City of Winnipeg, will be received at the office of the undersigned up to 11 a m. on WEDNESDAY, FEBRUARY 24th, 1909.

Specifications and forms of tender, together with conditions governing tenders as prescribed by by-law may be obtained at the office of the City Engineer, James Street, Winnipeg. The Board reserves the right to reject any or all tenders or to accept any bid which appears advantageous to the City.

M. PETERSON,
Secretary.

Board of Control Office,
Winnipeg, Feb. 3, 1909.

Notice to Contractors

Tenders for Public School Building, Trenton, Ont.

Sealed tenders addressed to the undersigned and marked on envelope "Tender for School Building" will be received until 12 o'clock noon of the 20th DAY OF MARCH, 1909, for the erection and construction, complete, of a Public School Building in the town of Trenton, Ont., in accordance with the plans and specifications prepared by the architect which may be seen at the office of Messrs. Ellis & Connery, Architects, Manning Chambers, Toronto, Ont., or with the undersigned at Trenton.

The lowest or any tender not necessarily accepted.

R. M. FOSTER,
Chairman of Building Committee

Dated at Trenton, Ont., 6th February, 1909. 7

Lewis & Ross, general contractors, Montreal, Que., have registered.

The assets of the North Arm Lumber Company, Limited, Vancouver, B.C., were sold by auction on February 8th.

ESTABLISHED 1886

Contract Record

In which is incorporated

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SUBSCRIPTION RATES.

Canada and Great Britain - -	$2.00
United States and Foreign - -	2.50

Vol. 23 Toronto, February 10, 1909 No. 6

A Law which Needs Amendment.

Of all disputes connected with the building interests none are so difficult of adjustment as those originating from labor troubles. When they are settled out of court they involve no end of inconvenience and loss, and when they are settled in court they involve both of these elements and often a pretty general feeling of discontent in some quarter. So long as trades and unions are governed by human legislation, however, disputes are bound to arise. The only way in which their evil may be mitigated is to reform our laws continually until we attain more nearly a standard where any semblance to a travesty of justice is practically impossible. It may well be contended that no law could be made that would satisfy all parties, especially when two apparently equal and indisputable rights come into conflict, but decisions are occasionally given which leave no doubt in the mind as to the fallibility of legal codes. An instance of this nature was recently afforded in the case of a stone mason, who, after securing damages for interference on the part of a union in the lower courts, had the issue reversed against him in the appeal. He applied for admission to the union, and was rejected because he considered that the proposed test of fitness was unfair, and would not submit to it. The union notified the employer that it was against their rules to work with non-union men, and that the men would be called out of the plaintiff was kept at work. In consequence of this notice, the man was dismissed, although but for this notice he would have been retained. As a result he was thrown out of employment and deprived of the right of earning his living by his own trade. The decision subsequently arrived at shows that the union kept within the pale of the law; moreover, the success of their appeal is an indication that they were fairly confident of their familiarity with legal intricacies—of which probably the non-union employee knew little or nothing.

Whatever legal technicalities there may be in this regard, the average lay mind will be impressed with the injustice of depriving a man of his daily bread because of his refusal to belong to a union. There appears to be no law against peacable persuasion or attempts to persuade peaceably, whether by trade unions or any one else, provided that the person persuading does not force himself on the person whom he persuades, and provided there is no threat of violence and no actionable annoyance. Nor is there any law which enables trade unions to compel a man to obey their commands and to desist from working with any third person willing to work with him. It seems that too wide a construction is placed upon "peaceable persuasion," and if subtle injuries are being perpetrated under its cloak it is timely to call attention to the need of abolishing the legal loopholes which render such things possible

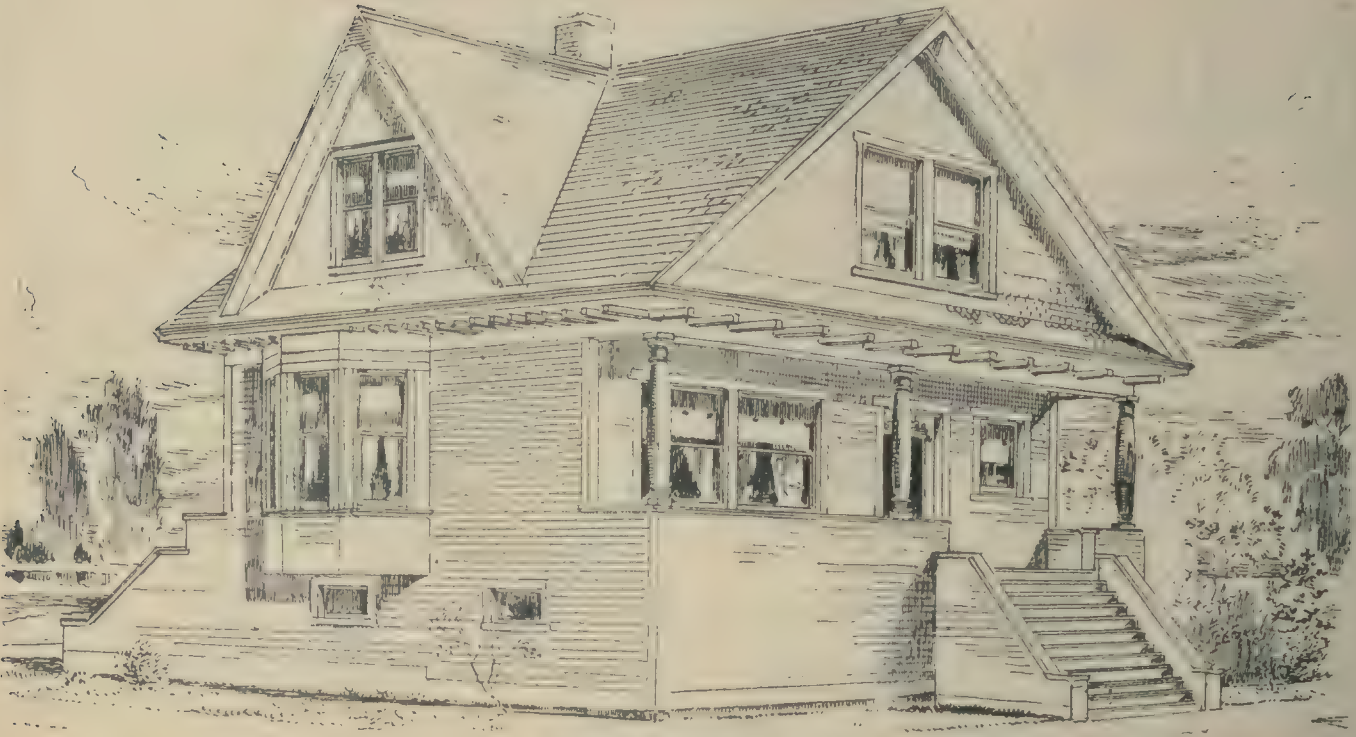
Bona fide trades-unionism is an excellent institution —it effects the co-operation of both master and man in raising the status and bettering the general conditions of both—but a union which is conducted upon degenerate principles and which uses its power arbitrarily and tyrannically is an association for which there should be no tolerance in any free country.

Why do Foreign Plans Escape Duty.?

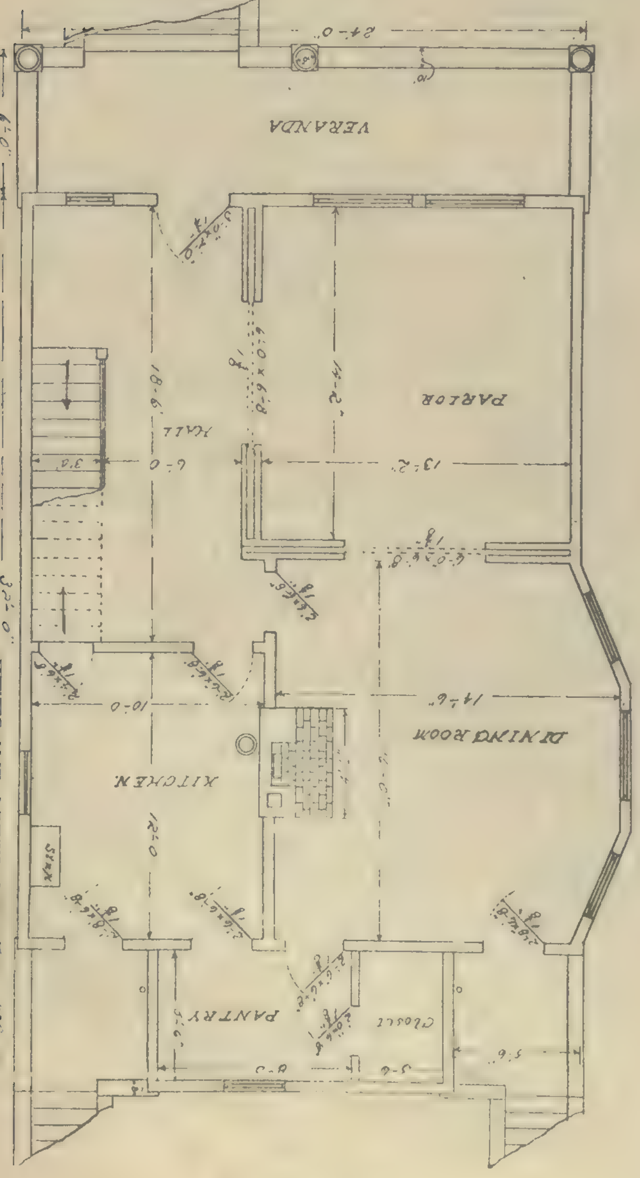
A matter which should receive immediate and thorough attention on the part of the Dominion Government, is the ease with which architectural plans and specifications are brought into Canada from the United States without paying duty. This has always been a source of complaint on the part of Canadian architects and has recently become much more serious than formerly. According to the reports presented at the annual convention of the Ontario Association of Architects, the duty is not only evaded, but in their efforts to have the matter rectified architects have met with indifference, and what appears on its face to indicate neglect, on the part of the Government officials. Those who have sought to obtain information at Ottawa regarding the reason for not enforcing the payment of the duty have received little encouragement.

There are many methods of evading the duty, a common one being to smuggle the plans across the border personally When architects learn of this having been done they frequently make complaint, and in some cases the result has been the collection of the duty. Architects, however, should not be obliged to spend a portion of their time in detective work for the Government. The collection of the duty should be attended to systematically by Government officials. Another method, over which the architects have to some extent a measure of control, is that of employing some local architect as associate with a United States firm. The Canadian architect obtains a commission on the construction of the work and the plans are ostensibly issued from his office, thus escaping the payment of duty. If the sense of honor of some architects is too low to permit of this being put an end to in a natural way, legislation should be sought making it illegal.

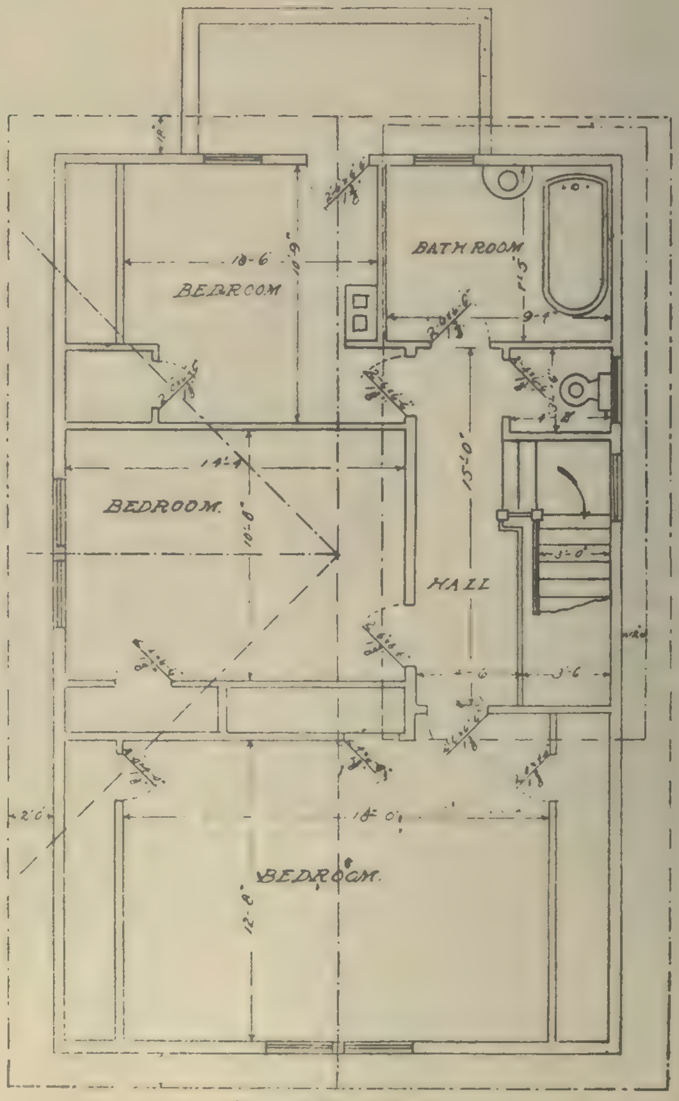
Canadian plans never, by any fortunate chance, find their way into the United States. The duty is high and those who have its enforcement in charge understand that the law is made to be enforced. Canadian architects are wondering why the Canadian Government does not take a similar view of the situation and why they should so persistently refuse to see that Canadian architects get fair play



A Vancouver Cottage.



First Floor Plan.



Second Floor Plan.

An Attractively Designed Cottage at Vancouver

A Plan Possessing Individuality and Involving only a Moderate Cost

The house illustrated on the opposite page was designed by Mr. Charles A. Hilchey, Vancouver, and erected at a cost of $2,400. The dimensions are 26 by 38 feet.

The main thought in the mind of the designer was to produce a plan that would possess some individuality and at the same time keep the cost down to the minimum. This plan is particularly suitable for the suburbs or small city, as it could not be built on less than a 30-foot lot.

While it is plain in design, both on the exterior and interior, it is very neat in appearance. The large gable on the one side and the flat-roofed dormer on the other present a very distinct exterior effect.

A glance over the floor plants shows how conveniently it is planned. No basement plan is shown, but there is a basement under the whole house. On the first floor there are parlor, dining room, kitchen, pantry and reception hall leading through to the kitchen and dining room, the sliding doors from hall to parlor, and parlor to dining room, the fireplace and large bay window in dining room. The doors leading outdoors from both dining room and kitchen are all commendable features.

On the second floor there are three large bedrooms, bathroom, hall and closets. The water closet separate from bathroom is another very desirable feature.

This would make a very comfortable home, and when nicely painted would present a very distinct appearance.

Following are estimates:

Excavating and Masonry.

40 yards excavating, 25c.	$ 10 00
340 cubic feet concrete footing, 25c.	85 00
18 lineal feet chimney breast, $2.25	40 50
17 lineal feet chimney above breast, $1.80	30 60
Total excavating and masonry	$166 10

Lumber Bill.

	Feet
8 2x8x16 ft. wall plates	168
8 2x6x16 ft. wall plates	128
60 2x4x12 ft. first section of outside studding	480
16 2x4x16 ft. plates	176
60 2x4x18 ft. outside studding	480
40 2x4x12 ft. gable studding	320
10 2x4x12 ft. dormer studding	80
13 2x8x24 ft. first floor joist	416
13 2x8x16 ft. first floor joist	273
13 2x8x12 ft. first floor joist	208
5 2x8x14 ft. first floor joist	95
16 2x8x12 ft. porch joists	256
14 2x6x16 ft. second storey joists	224
14 2x6x18 ft. second storey joists	252
26 2x6x12 ft. second storey joists	288
10 2x4x12 ft. lookouts	80
12 2x4x14 ft. over pantry and rear porches	108
60 2x4x18 ft. first storey partitions	720
80 2x4x16 ft. second storey partitions	880
50 2x4x16 ft. plates	550
14 2x4x14 porch ceiling	126
40 2x4x20 ft. rafters	520
10 2x4x16 ft. rafters	110
30 1x6x12 ft. braces, common	180
20 1x3x18 ft. backing, common	90
20 2x2x16 ft. furring, common	110
Total feet framing lumber	7,318

7,318 ft. framing lumber, at $25	$182 95
1,000 ft. No. 2 8-inch y. p. shiplap, first storey rough floor, $25	25 00
2,850 ft. No. 2 8-inch y.p. shiplap for outside walls, $25	71 25
3,000 ft. No. 1, ½x4-inch R.C. siding, $27	81 00
3,500 sq. butt dimension shingles, $4	14 00
2,000 round butt dimension shingles, $4	8 00
15,000 extra star-A-star R.C. shingles, $3.75	56 25
1,700 ft. sheathing, No. 2, 8-inch y.p., $25	42 50
290 ft. 1 x 4x12 ft. clear fir flooring,, $40	11 60
280 ft. ⅝x 4x12 ft. No. 1 fir ceiling for porches, $27	5 56
600 ft. ⅝x 4x12 to 18 ft. No. 1 fir ceiling, cornice, $27	16 20
1,100 ft. 1 x 4x12 to 16 ft. No. 1 y.p. flooring, $38	41 80
850 ft. 1 x 4x12 to 16 ft. No. 2 y.p. flooring, $36	30 60
200 ft. 1 x10x16 ft. clear fir finish, $40	8 00
200 ft. 1 x12x16 ft. clear fir finish, $40	8 00
150 ft. 1 x 8x16 ft. clear fir finish, $40	6 00
150 ft. 1 x 8x16 ft. clear fir finish, $40	6 00
50 ft. 1 x 4x16 ft. clear fir finish, $40	2 00
400 ft. 1⅛x12x12 ft. clear fir finish, $45	18 00
500 lbs, tarred felt building paper, 2½c.	12 50
Total lumber bill	$647 21

Mill Work.

3 porch columns, 12x12x7 ft., $3.25	$ 9 75
2 square columns, 6x6x7 ft., $1.25	2 50
2 newels, 6x6x2 ft., 75c.	1 50
150 ft. 4-inch crown mold, 2c.	3 00
150 ft. 2-inch bed mold, 1c.	1 50
50 corbel brackets, 3x4x16 inches, 20c.	10 00
200 ft. ¾-inch cove mold, ½c.	1 00
100 ft. ¾-inch quarter round, ½c.	50
80 lineal ft. cap rail for porches, 10c.	8 00
2 cellar rod frames, 32x18, 1 lt., $1.80	3 60
2 cellar sash, 32x18, 1 lt., $1.00	2 00
1 double mullion window frame, 40x30, 2 lt.	4 50
2 windows, 40x30, 2 lt., D.S., 1⅜, $4.90	9 80
2 window frames, double mullion, 30x30, 2 lt., D.S., 1⅜, $4.50	9 00
4 windows, 30x30, 2 lt., D.S., 1⅜, $3.50	7 00
3 window frames, 26x26, 2 lt., $2.25	6 75
3 windows, 26x26, T lt., S.S., 1⅜, 1$.75	5 25
1 window frame, 40x30, 2 lt.,	2 25
2 window frames 30x30, 2 lt., $2.25	4 50
1 window frame, 36x30, 2 lt.	3 00
1 window, 40x30, 2 lt , D.S., 1⅜	4 90
2 windows, 30x30, 2 lt., D.S., 1⅜, $3.50	7 00
1 window, 36x30 2 lt., D.S., 1⅜	4 30
1 sash frame, 20x12, 1 lt.	1 50
1 sash frame, 30x14, 1 lt.	1 40
1 sash frame, 30x16, 1 lt.	1 40
1 sash, 20x42, 1 lt., D.S.	1 00
1 sash, 30x14, 1 lt., S.S.	75
1 sash, 30x16, 1 lt., S.S.	85
1 front door frame, 3 ft. x 7 ft.	2 50
2 outside door frames, 2 ft. 8 in. x 6 ft. 8 in.	4 50
1 outside door frame, 2 ft. 6 in. x 6 ft. 6 in.	2 25
2 sets sliding door pambs, 6 ft. x 6 ft. 8 in., $1.60	3 20
4 sets pambs, 2 ft. 6 in. x 6 ft. 8 in., 60c.	2 40
1 set jambs, 2 ft. 4 in. x 6 ft. 8 in., 60c.	60
1 set jambs, 2 ft. x 6 ft. 8 in	60
4 sets jambs, 2 ft. 6 in. x 6 ft. 6 in., 60c.	2 40
3 sets jambs, 2 ft. 4 in. x 6 ft. 6 in., 60c.	1 80
2 sets jambs, 2 ft. x 4 ft., 40c.	80
1 set jambs, 2 ft. x 6 ft. 6 in	55
1 front door, 3 ft. x 7 ft., 1¾, glazed	10 00
2 doors, 2 ft. 8 in. x 6 ft. 8 in., 1⅜, glazed, $4.20	8 40
1 door, 2 ft. 6 in x 6 ft. 6 in , 1⅜, glazed	4 20
4 sliding doors, 3 ft. x 6 ft. 8 in., 1⅜, $3.00	12 00
4 doors, 2 ft. 6 in. x 6 ft. 8 in., 1⅜, $2.50	10 00
1 door, 2 ft. 4 in. x 6 ft. 8 in., 1⅜	2 40
1 door, 2 ft. x 6 ft. 8 in., 1⅜	2 30
4 doors, 2 ft. 6 in. x 6 ft. 6 in., 1⅜, $2.40	9 60
3 doors, 2 ft. 4 in. x 6 ft. 6 in., 1⅜, $2.40	7 20
2 doors, 2 ft. x 4 ft., 1⅜, $2.00	4 00
1 door, 2 ft. x 6 ft. 6 in., 1⅜, $2.20	4 40
90 plinth blocks, 4c	3 60
744 ft. casing, 12 ft. length, 2c.	14 88
260 ft. head casing, 12 ft., 2c.	5 20

260 ft. cap mold, 2c.	5 20
260 ft. fillet, ½c.	1 30
72 ft. window stool, 2½c.	1 80
72 ft. apron, 2c.	1 44
256 ft. window stops, 16 ft. length, 1c.	2 56
432 ft. door stops, 14 ft. length, 1¼c.	5 40
6 thresholds, 10c.	60
600 ft. base, 3c.	18 00
600 ft. floor mold, ½c.	3 00
Total mill work	$277 58

Summary.

Excavating and masonry	$166 10
Lumber bill	647 21
Mill work	277 58
Mardware and tinwork	105 00
Carpenter work	500 00
Painting	110 00
Plastering, 750 yards, at 27c.	202 50
Plumbing	250 00
Electric wiring	35 00
Incidentals, 5 per cent.	114 66
Total estimate	$2,408 05

Change for Vancouvers Builders Law.

It is expected that the Vancouver Building Inspector will ask for a number of changes in the building by-laws this year, as a result of the frequent evasions of the existing by-law. As the law now stands it is possible, at the cost of a small fine, to do as one pleases despite the legal restrictions. The by-law does not provide for the removal of a building which has been erected in a manner contrary to its provisions. The maximum penalty is a small fine, not amounting to more than $50 or $100. Among the offenders the most objectionable are the Chinese, who are notorious for crowding together in close quarters. The inspector frequently finds that the interior construction of their buildings has been altered, without permission, after the original plans have been submitted to the department, so as to provide for a greater accommodation. There are cases in Chinatown where 30 or 40 rooms have been constructed in the interior of buildings which are entirely without access to the air, and would not have been permitted if they had been shown on the plans. An amendment to the law will be sought for the purpose of preventing this from being done, with only the liability of a small fine.

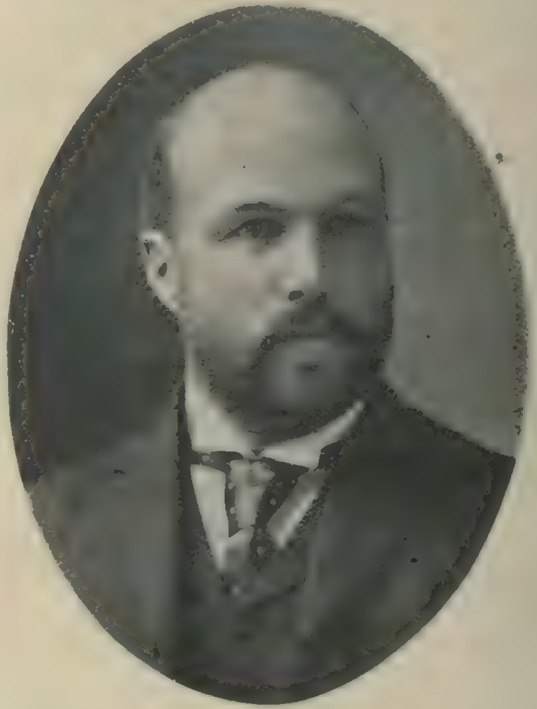
Opposition to Cement Sewer.

Mr. E. M. Trowern, secretary of the Retail Merchants' Association, appeared before the Toronto Board of Control last week to oppose the use of cement in the construction of the trunk sewer. Mr. Trowern told the controllers that if a cement sewer had to be subjected to acids and gases, they should make sure that it would stand the test. "The labor men who are interested in this project are prepared to pay engineers to go into this matter thoroughly," said Mr. Trowern, "and I think that this board should be prepared to hear evidence bearing upon the enduring qualities of brick and cement." As a result the controllers decided to ask Messrs. Rudolph Herring and John D. Watson, the sewer engineers, to report upon the qualities of brick and concrete for sewer purposes.

The work of altering and enlarging St. Saviour's Church at Penticton, B.C., has been completed, and the church was recently reopened. The work was under the superintendence of Mr. Creighton, of Penticton, the plans having been prepared by Mr. J. W. Balmain, of North Vancouver.

Civil Engineers' New President

George A. Mountain, of Ottawa, the new president of the Canadian Society of Civil Engineers, whose portrait is published herewith, is one of the most widely known members of the profession. He was born in Quebec in 1860, and educated there as a civil engineer. He served his apprenticeship with the City Engineer of Quebec and with Messrs. Kinipple & Morris, of London and Greenock. In 1878 he was transitman on the first surveys of the Quebec & Lake St. John Railway, and in 1879 instrument man on the original surveys of the Princess Louise Embankment, Quebec, and the Graving Dock at Levis. In 1880 Mr. Mountain was appointed first assistant on Division E of the Island Railway of Newfoundland. On March 31st, 1881, he joined the engineering staff of the Canada Atlantic Railway under Walter Shanley, and served with him as assistant engineer until 1886, when on Mr. Shanley's resignation he was made chief engineer of the Canada Atlantic Railway, at the time the steel bridge across the St. Lawrence River at Coteau was built.



George A. Mountain, Ottawa, President of C.S.C.E. for 1909.

In 1890 Mr. Mountain commenced the surveys of the Ottawa, Arnprior & Parry Sound Railway from Ottawa to the Georgian Bay, which was completed in 1897, and was afterwards amalgamated with the Canada Atlantic Railway system. In 1892 he was also chief engineer of the St. Lawrence & Adirondack Railway from Valleyfield to Malone, still continuing his connection as chief engineer of the Canada Atlantic Railway until 1904 when he resigned to accept the position of chief engineer to the Board of Railway Commissioners for Canada, which he still holds. Mr. Mountain served for twenty-three and a half consecutive years on the Canada Atlantic System. He is a member of the Canadian Society of Civil Engineers; American Railway Engineering & Maintenance of Way Association; American Superintendents of Bridges & Buildings; Royal Astronomical Society, and Dominion Land Surveyors.

Personal Mention

Mr. Gordon Johnston, son of J. W. Johnston, of Belleville, Ont., has been appointed engineer-in-charge of a large irrigation scheme in Mexico.

Mr. George A. Scoville has been appointed assistant superintendent of buildings and grounds at the University of Toronto.

Mr. A. W. Swan has been appointed resident engineer of the Montreal harbor. Mr. Swan carried out the construction of the Bristol docks.

Mr. T. F. Scott, C.E., has been recommended by City Engineer Rust for appointment as his assistant. Mr Scott had charge of the construction of the recent extension of the T. & N. O. Railroad to Cochrane.

Mr. Collingwood Schreiber has been selected by the chief engineer of the National Transcontinental and the chief engineer of the G. T. P. to serve in the arbitration reclassification in connection with railroad contracts.

The Queen Victoria Niagara Falls Park Commission at a meeting last week appointed Mr. T. H. Jackson to fill the vacancy caused by Mr. Wilson's acceptance of the Park Commissionership of Toronto. Mr. Jackson, who has been filling the position temporarily since Mr. Wilson's transference, was formerly city engineer of Niagara Falls, Ont.

Mr. Albert Pearce, who has been for some time the secretary of the Winnipeg Builders' Exchange, has resigned his office and accepted a responsible position with the National Supply Company of Winnipeg. Mr. Pearce by his courteous and arduous work has made an enviable reputation and his services will be missed by all the members of the Winnipeg Builders' Exchange.

Many New Buildings Planned for Toronto

An active building season is anticipated in Toronto this year. Among the many structures for which plans have been prepared or are being prepared, and upon which construction will commence this season, are the general hospital, technical school, Bell Telephone Company's office buildings, addition to Western Hospital, addition to Isolation Hospital, Shea's theatre, firehall and police station at East Toronto, addition to T. Eaton Company's building, Education building in connection with Toronto University, Vokes Hardware Company warehouse, firehall on Perth Avenue. These buildings are only a small part of the building operations contemplated for 1909. In addition to these the Board of Education expect to erect one or two new schools and add several rooms to others. It is expected that there will be a large number of dwellings erected during the year. It is pointed out that although the police census showed over 2,000 vacant houses, this number is not considered excessive in a city with a population of over 300,000. With the annexation of the outlying districts there will be considerable building activity away from the more congested part of Toronto. City Architect McCallum states that he expects to be very busy in connection with the proposed city buildings. In addition to new firehalls and police stations, an addition will be built to the main pumping station, and the Assembly Hall at the City Hall will be finished for conventions and public meetings.

The Civic Property Commissioner asks in his estimates for $464,600, as compared with an expenditure of $148,607.21 last year, but of this amount $262,000 is to cover the purchase of sites and additional fire stations, and for a fireproof instrument building to house the new central fire alarm telegraph adjoining the central station in Adelaide street. The special items are:

The erection of a fire hall at East Toronto; purchase of site and erection of fire hall at College Heights; purchase of site and erection of fire hall in the vicinity of Bathurst and Dupont streets; purchase of site and erection of fire hall in vicinity of Perth avenue and Bloor street; four police and patrol stations, as follows: neighborhood of Niagara and Queen streets, $33,000; vicinity of C.P.R. crossing on Yonge street, to replace No. 5 station, $33,000; vicinity of Bloor and Bathurst streets, $33,000; building at East Toronto, $28,000.

Publications.

The January number of "The Studio" (London: 44 Leicester Square, W.C.), contains reproductions of the designs submitted for a country cottage in a recent competition. To all students of architecture the competitions conducted by this publication are of great value, for in the criticism of the various designs, "The Studio" is conducting a correspondence school in its most beneficial form.

From the Industrial Publication Company, New York, we have received a copy of a short treatise, entitled "Modern Cement Sidewalk Construction," by Charles Palliser, in which is explained in concise and simple terms the best method of making durable cement sidewalks. Practical men engaged in this line of construction will find many useful pointers in this work. Price, 50 cents.

The fourth edition, revised and enlarged, of "A Guide to Sanitary Inspections," by William Paul Gerhard, C. E., has now been issued by Messrs. John Wiley & Sons, New York. No sanitary engineer should be without a copy of this work. The new edition enlarges the scope of the book by taking into consideration not only city and country houses, but also public buildings, hospitals, schools and theatres. A large number of schedules for inspections, with questions, are given. Price, $1.50 net.

An excellent collection of illustrations entitled "Detached Dwellings," has been published in portfolio form by the "American Architect," 231 39th street, New York. This collection differs from others in that it represents houses which have actually been built. The houses are the work of the most prominent architects, in all parts of the country. There are 96 illustrations, accompanied by a short article by Wilson Eyre. Each elevation is accompanied by a floor plan. There are also a number of pen and ink sketches, which exhibit masterly treatment of the subjects under consideration. All classes of construction are included, among them being wood, brick, concrete and combination structures. As the illustrations are reproduced from photographs they exhibit a considerable amount of fine detail. A number of interiors and doorways are shown, which add materially to the value and interest of the collection. The collection is one which can be commended earnestly to all architects on account both of its completeness and its general appearance. The illustrations are examples of the choicest class of half-tone work. Being in portfolio form, the usefulness of the collection is much enhanced, because of the readiness with which each illustration may be removed and studied and replaced without disturbing the collection. The cover of the portfolio is attractive and simple. The portfolio is published at $5 per copy.

The Present and Future of Cement Block

Its Rapid Development—An Important Factor In Future Construction—Paper By J. A. Smith.

An interesting paper, entitled "The Present and Future of the Cement Block," was recently read by Mr. J. A. Smith, secretary of the Ideal Concrete Machinery Company, South Bend, Ind., before the National Association of Cement Users' convention at Cleveland, O. Mr. Smith's remarks were in part as follows:

Cement blocks are destined to play an important part in all forms of construction work in the future. Concrete construction is here to stay. It has every virtue possessed by any other building material, and possesses some not possessed by any other. When we look back and see the development of the cement block, note the difficulties through which it has passed, consider the mistakes that has been made both in its manufacture and exploitation, it is a wonder it has survived, and it would not have survived had it not inherently, the virtues it possesses. I need not call your attention to the dark period of the past; you are all familiar with the history of this material; how it was first molded in sand, then in wood forms, then in iron forms, then came the machine for manufacturing them, then a period of strong effort to have them used in construction work with indifferent success, then a period of constant pioneering, and finally the invention of a simpler machine for producing them that opened the way for a flood of entrants into the business.

With the flood came many incompetents, and with the flood also, there arose, like mushrooms in the night, a rush of machine manufacturers whose strongest desire was, in many cases, to get a piece of the good thing that was going around, regardless of the past, present or future of the business Designs were furnished which produced blocks of the rankest artificiality in rock designs, the blocks were in many cases untrue in measurements, preposterous so far as the ventilation of the block was concerned, from a structural standpoint, and, because of the lack of business training or business instincts of many who entered the business, the blocks turned out were porous, imperfectly made, an eyesore and a detriment to the business. In every great business, we find a first period of enthusiastic effort, then the lull which comes, and then the conservative, painstaking, upbuilding era which ensues, and which means the development of the business on fundamentally correct lines.

Since the unpromising beginning which I have just related, perhaps it is necessary to show the development of concrete blocks from that beginning. In the first place, as I have said, many machines fell in the hands of incompetent people, people who had no experience whatever with concrete, knew nothing whatever of the selection of aggregates, mixing of the material, or curing of the stone, and they, therefore, found the easiest way to turn out blocks was to make them dry tamped. They added too little water to properly crystallize the cement. The development of the manufacture of good concrete stone in this regard has been marked and pleasing, until now instead of dry tamped blocks, they are tamped wet, just as much water being added as will permit the block to be removed from the machine without sagging or sticking. I, therefore, desire to say that it is essentially necessary for the proper manufacture of good cement blocks to select your aggregates with great care. You should use that proportion of sand and gravel which will secure the least possible voids. Then, proper mixing is essential. If hand mixed, the mass should be turned over at least three times in a dry state, and at least three times in a wet state, after the water has been added. You will find also if you use an ordinary rake as a last means of mixing your concrete, both in a dry and in a wet state, this will help the mixing of the materials very much. I need not say that this should be done after the mass has been turned at least twice with a shovel.

Measure Water Carefully.

Particular stress may be laid upon the use of the proper kind of water and the necessity for measuring the amount of water used in making cement blocks. It is the writer's experience in several cases where blocks of different colors and shades were produced, using identically the same material, the same cement, and the same water, it was found that this change of color was caused by the water used. Tanks were erected for settling purposes, and then the cleared water used in the manufacture of the blocks, with the result that this discoloration or change of color disappeared entirely. With regard to the use of the proper amount of water, the question as to which is the better, the wet or the dry mixing of concrete, has been much discussed, and recently in Germany there were given out the results of extended experiments covering some four years. From these reports the conclusion is drawn that the smallest amount of water which produces a mixing suitable for ramming, gives the strongest concrete. The results of these experiments confirm that which other experiments covering shorter periods of time indicated, and will not occasion any surprise. At the same time, the concrete worker who attempts to use the smallest amount of water which will produce a mixture suitable for ramming, will find many practical difficulties. There is, therefore, but one thing to do, viz., measure the water as well as the other aggregates for each batch mixed.

The proper curing of blocks after they are made is, of course, essential, indeed it is very essential, but it only plays its part in the whole process of manufacture. The possibilities of the cement block business have been too greatly underestimated until the last few years, and even now there are large fields still open. A few years ago concrete blocks were used for little less than foundations and cellars. The blocks of those days were usually of rock design, and as we have pointed out, the very worst rock effect at that. It seems strange upon consideration of this part of the business that, that design was chosen for the most general exploitation of cement blocks which represented in the highest degree the artificial character of the product, and at the same time was the most difficult to closely imitate. There is no dressed stone design that varies so greatly as the rock, or quarry, faced stone, and there is no dressed natural stone so cheap as this design, therefore, in selecting this one for exploitation of cement blocks, the extraordinary and peculiar fact was brought home to us all that it required a greater manufacture and use of this design to produce a pleasing effect than with any other that could be secured.

The materials most commonly used in concrete block manufacture are sand, gravel, or crushed stone, and Portland cement. A lengthy paper could be written on sands alone, so that I will touch upon this subject but very briefly. The term sand is confused by a great majority of block manufacturers. In concrete work, sand is termed as that material which will pass a quarter-inch screen, and a good sand should be graded from coarse to fine, with the coarser grains predominating over the finer ones. A sand which is well graded from coarse to fine, is the one which will make the strongest concrete, and such sand, makes the densest concrete. The strength of concrete varies directly with its density. This is a well known fact, and one about which much has been written, so I will pass it by at this time without further comment. Let me lay down this fact, however, and call your particular attention to it, that no concrete can be stronger than the materials from which it is made. Many block manufacturers insist on using for facings a very fine sand in mixtures of 1 to 2, not realizing that a coarse, well graded sand will give them as strong a facing with a 1 to 3 mixture and a block of as good appearance as well. They make the excuse that they must use a fine sand in order to get a smooth block. When the tamping is directly against the face, as in most machines, the finer particles work themselves through the coarser ones into the face, and thus the surface is just as smooth as though a fine sand were used. Therefore, just as good a surface can be obtained by using coarse, well graded sand, and such a surface will be far stronger and more waterproof. The reason for this is, that in a fine sand the grains are nearly all uniform in size, and the percentage of voids will be between 40 and 50 per cent., whereas, in a well graded sand they may be as low as 25 per cent., consequently when using the same amount of cement with both sands, the coarser sand will make a denser, stronger and more waterproof concrete.

Another reason is, that for a given volume, the fine sand will have a greater number of particles, and consequently there is more surface to be coated with the cement mortar than in the case of the coarse sand. This means that more cement is required. I desire again to touch upon the question of mixing the aggregates in the manufacture of blocks, and I wish to say, that it is very important to mix your aggregates with a mixing machine of a good type. You should be sure, of course, that the machine by its operation performs its work correctly, and coats the aggregates properly, in the process of mixing.

The Facing of Concrete Block.

The subject of facing cement blocks is one which well deserves attention. Blocks are usually sold because of their good appearance and satisfactory qualities, and the man who faces his blocks with material which gives them life, is the one who gets the business. One of the serious objections to concrete blocks in the past is their dark gray appearance. This can be overcome by using light colored sand, or crushed stone, and a white Portland cement, which will give a light gray effect. If a pure white effect is desired, then white cement should be used, with white sand, or crushed stone, mixed with a little marble dust. It is very difficult to obtain a coarse white sand, although I have seen a few samples which were quite coarse. A fine white sand used alone with cement, will not make a thoroughly waterproof facing. In order to make such facing waterproof, I have found it necessary to use a proportion of marble dust, or crushed stone, with the sand. Care must be taken not to use too much marble dust, for if too much of this is used, the facing will check and show unsightly cracks. For this reason, marble dust should never be used alone with cement. Usually the checks and hair cracks referred to will not show until the blocks have aged several weeks, and even months, but eventually they are bound to come. The amount of marble dust to be used should not be more than 1½ parts of marble dust to 4 parts of white sand. If the facing is too rich in cement, checks and hair cracks are liable to appear as when marble dust is alone used with cement. Very good results can be obtained by using limestone screenings, from coarse to fine, which will pass a quarterlinch screen, but usually it is advantageous to use a little white sand with this as well, in order to produce a smooth, dense surface.

Propcrtions for Maximum Strength.

This brings us up to the proportions which should be used to produce maximum strength in cement blocks. The specifications of this association require a minimum crushing strength of 1,000 pounds per square inch of superficial area at the age of 28 days. They further call for proportions of 1 part cement, 3 sand, 4 gravel. Where a good coarse sand is obtainable it is sometimes more economical to use sand only in the proportion of 1 part cement to 4 parts of sand, pit run. If the sand is coarse, and well graded, such blocks will develop over 1,000 pounds per square inch in 28 days. I call attention to this part of the specifications of the association because it has been found in actual practice that it is frequently not possible to get good gravel, while good sharp sand can be found in quantities. I therefore call your attention to the comparative cost of blocks when using proportions of 1 part of cement to 4 parts of sand, pit run, when same is a good coarse grade, as against 1 part of cement, 3 parts of sand and 4 parts of gravel, when sand and gravel have to be screened. The cost is then considerably higher than the ordinary sand. As for instance:

100 8x8x16-inch blocks, in teh proportion of 1 part of cement will require:

1 41-100 yards of sand at 60 cents	$ .85
2 68-100 barrels of cement at $1.50	3.95
Total	$4.80

100 of the same blocks, when made 1 : 3 : 4, and with a facing 1 : 2, will require:

1 5-100 yards of gravel at $1.	$1.05
79-100 yards of sand at $1	.79
2 2-100 barrles of cement at $1.50	3.03
Total	$4.87

Therefore, you will see, in such cases as the above, where the price of cement, sand and gravel is considerably higher than that of pit run sand of a good coarse character, it is more economical to use 1 part of cement to 4 parts of sand, as the materials in this will cost less, and the labor of mixing will also be less. It has always seemed to me that it is most important to get the requisite strength regardless of proportions, and if a 1 : 4 sand concrete will give these results, I say use a 1 : 4 mixture. The same holds true of a 1 : 3 : 6 mixture, providing it will give the required strength. Proportions of 1 : 2 : 4, 1 : 3 : 4, 1 : 2½ : 5, and 1 : 2 : 5, should all prove rich enough in cement to make blocks which will develop a crushing strength of 1,000 pounds per square inch at 28 days. I therefore think our specifications ought to allow the use of any proportions that will meet the strength requirement.

Curing the Blocks.

This brings us up to the subject of curing. Wet tamped blocks should be sprinkled two or three times daily for a period of two to three weeks. They should

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be sprinkled after molding as soon as the concrete has obtained its initial set, which it will do in from 12 to 24 hours. The temperature of a curing room should range from, say, 80 to 180 degrees Fahr., provided the blocks are kept sufficiently wet. The temperature of the curing room should never be lower than the freezing point of water, for if carried below this point, the blocks will freeze, and even though they be not injured, the setting of the cement will be delayed; in fact, the blocks will be no stronger at the time they thaw out than when they first froze, for the process of hardening stops at the time of freezing and does not resume until the blocks are thawed out. Many manufacturers will use blocks a few days after they are made, but this is a great mistake, and should never be allowed, as blocks cured by the sprinkling method for a few days are not strong enough to build in structures, and it is just work of this kind that discredits the use of this material. Every now and then one can see blocks that are so crumbly that the surface can be cut away, and this, almost invariably, is caused by insufficient water in the mixing, or insufficient curing. It sometimes is caused by not using enough cement, but the former reasons are more often the case. Another point I wish to emphasize is the fact that no amount of subsequent sprinkling will make up for an inadequate amount of water in the mixing of the concrete; that is to say, if a man uses but half as much water in his concrete as he ought for a good block, no amount of subsequent sprinkling will make that block what it should be. Waterproofing is a subject that has had the earnest attention of many people. Good, dense concrete, absolutely waterproof and impervious to moisture, can be made by the proper selection of aggregates, the proper mixing of the materials, the addition of a sufficient amount of water and a proper curing of the stone. This is particularly true where you can use a rich facing mixture for the block, but to make assurance doubly sure, there have been devised waterproofing compounds and waterproofing fillers to make the blocks dense and impervious to moisture.

A good complete plant should be well laid out, with sufficient buildings and sufficient yard room in which to conduct the business satisfactorily and economically. Elevators should be used to elevate the materials above the mixing machines; mixers are essentially necessary; power tampers should be installed, and I believe the future will demonstrate that cement blocks should be cured by high pressure steam. I believe the tests which were carried out at St. Louis, and which have been conducted for some time past, have conclusively proven that there is a method of steam curing, under pressure, that is safe and sound, and that this method produces results that are really astonishing. The future for cement blocks is most promising. Indeed, the use to which this material will be put will be of the widest character, and it is difficult to exaggerate the importance of cement blocks in future construction work. Their manufacture is a business in which great profit can be made; it is a business which is worthy of the highest craft and care, and if you will perform your share in turning out blocks of acceptable design to the architect, blocks of good appearance, well cured, and which will be impervious to moisture, you will one day reap the harvest you have worthily prepared.

The honor of having the greatest increase in building during 1908 over 1907 belongs to Fort William, Ont. The increase was almost double, being over 95 per cent. Halifax was second, and Edmonton third, with an increase of 12 per cent., Vancouver being fourth with an increase of 6 per cent.

The Employer and the Laborer

At the Canadian National Association of Builders' convention held in Montreal, Mr. William Tytler, executive officer of the London Builders' Exchange, read an interesting paper dealing with three live topics, namely, the conditions created by organized labor, the liability of employers, and the need of technical schools. Mr. Tytler's remarks were in part as follows:

Labor's Unreasonable Demand.

At the opening of each season we have been met with demands for increased pay, until wages have advanced fully fifty per cent. within five years. I do not, of course, complain of any demands which are within the bounds of reason, as I believe the increased cost of living justifies increased remuneration, but what I do object to is being held up for advances at times when for the employer to yield means serious loss to him. Instances are not uncommon where builders have taken contracts late in the season at prices based on the wages then paid. The work may take the greater part of the next season to complete; but when operations are about to be resumed in the spring the contractor finds himself confronted with demands, to concede which is to lose whatever profit there might originally have been in the job, and very likely more, too, while to resist is to incur even greater loss, as a strike means the disorganization of the building trades, more or less, for the remainder of the season.

Another demand of organized labor which contractors regard as most unfair is for the recognition of the union, which often means practically handing over the management of the contractor's business to his employes. There are many contractors who, while recognizing the unreasonableness of this demand, yield to it for the sake of peace, but it is a peace obtained at the expense of the employer's independence, and is apt to lead to financial loss, if not disaster. In my opinion the only way by which an employer can maintain his business independence and at the same time keep at peace with organized labor, is by standing by the principle of the "open shop" which enables him to employ and keep in his employ good reliable workmen, irrespective of whether they are members of the union or not.

Liability.

The question of the liability of employers in connection with accidents to emloyees is one of extreme importance to building contractors. Doubtless many now present have suffered as a result of existing conditions. An accident happens on a building in course of construction and one or more employees suffer death or injury in consequence. The announcement of the occurrence in the newspapers is a signal for some needy lawyer to get after the victim or his family and induce the interested ones to take legal proceedings against the employer. So quickly is this done that not infrequently the machinery of the law has been set in motion before the employer can see the parties with the object of effecting a just settlement, such as any honorable employer is always ready to do.

The lawyer, however, is after big fees, and has seen to it that his client will not yield, and when finally the case gets into court, the chances are that it will be decided solely from the standpoint of sympathy, rather than equity and justice, the merits of the case will be ignored and the probability that the victim was guilty of contributory negligence will be lost sight of, the result being substantial damages. Employers have long suffered from such injustice, and I do not believe there will be any relief from it until such discreditable conduct as that referred to on the part of the lawyers, is made an offence punishable by forfeiture of gown, and the trial of such cases by jury is abolished. In my opinion justice can only be obtained by judges alone hearing the evidence and deciding such cases on their merits.

Manual and Technical Education.

The difficulty of inducing boys to enter any of the skilled trades as apprentices is becoming more marked every year, and I do not think I make any mistake when I express the belief that as a result first-class workmen will become scarcer and scarcer as time goes by. This is a serious matter for all those engaged in the various industries, and unless something is speedily done to direct the attention of boys to the trades, the country will eventually be confronted with a grave problem. To my mind the fault is with our educational system, the whole tendency of which is to prepare the boy for a professional career, to the absolute neglect of the skilled trades. A boy passes the entrance examination and if he desires to continue his studies the only course open to him is along professional and, to some extent, commercial lines.

The only remedy is to be found in the establishment in this country of a thorough system of manual and technical training in connection with our public schools, by means of which there will be developed in the boys a taste and an aptitude for skilled labor. This is a subject in which interest has been rapidly growing during late years—a fact which is proven by the influential deputations representing various bodies that have from time to time waited on the Dominion Government asking the Federal authorities to appoint a commission to consider the whole question and its application to the Dominion as a matter of national concern.

It is pretty well known that Germany is the birth place of manual and technical education. Years ago properly equipped institutions were established in that country for the carrying on of this work, the great technical institute at Charlottenburg being the most elaborate and perfect in the world, and the result was that German manufacturers were soon found to be so superior to those of England and France that the words "made in Germany," on an article were regarded as a guarantee of worth. England was the first country to follow Germany's example, and France followed soon afterwards. Since then the idea has taken hold in the United States, but in Canada little has been done. True, manual training has been adopted in connection with the schools of some of the cities and towns of Ontario, but so far as technical training is concerned nothing has been attempted in that province outside of the work done at the School of Practical Science, the School of Mines, and the Agricultural College.

As to the advantage of the introduction of these branches into our educational system there can be no doubt. In the first place the boy in the common school would naturally be attracted by manual training, it having been found that he welcomes as a relief from his studies any opportunity to use tools. Indeed to the average boy the workshop is more attractive than the playground, and he looks forward to the manual training period with pleasurable anticipation. By the time he is ready for the technical course, he has acquired considerable skill, and the chances are that whether he continues his training or is obliged to begin to learn to make his living, he will take to one of the trades from the pure love of "making things' which has been instilled into him.

The experience of some of the technical schools of the United States is interesting in this connection. It has been found that a boy of sixteen studying at school until his eighteenth year and preparing himself for admission to one of the higher institutions of technical training, is, after a four years' course, or at the age of twenty-two, ready to begin practical work. Carefully prepared statistics show the average starting wage to be $13 a week, or the same wage earned by the regular apprentice at the age of twenty-one and a half years, and by the trades or manual training school graduate at the age of nineteen and a half years. In other words apparently a graduate of a technical school has lost by his six years of preparatory study, having been beaten by the regular apprentice by six months and by the trades school graduate by two and a half years. From this time, however, there develops an interesting and most instructive line of progress.

The regular apprentice, who is earning $13.50 a week at the time the technical graduate is earning $13, is overtaken in six months, and we find both earning $14, and the technical graduate receives $15.80 nearly one year before the regular apprentice. In other words, while it has taken the regular apprentice three years to incrase his wages from $11.50 to $15.80 a week, the technical graduate has done the same in fifteen months. Progress now continues on substantially the same line. and the technical graduate is soon found earning $22 per week—passing the trades school graduate in three years' time—a worthy tribute to the higher education and attainment. The progress of the technical graduate continues with earning capacity regularly increasing and a corresponding augmentation of potential or invested value, until at the age of thirty-two, or ten years after entering upon the practical work, we find the technical graduate earning $43 per week. That is to say, six years of preparation have enabled him to out-distance the shop-trained man and the trades school graduate overwhelmingly. The value of the worker is increased owing to the increased value of the product he is able to turn out. Such is the experience of graduates of United States technical schools. It shows that not only do these institutions bring boys to the trades, but make of them mechanics of eminently superior skill.

Some people are of the opinion that as this is a matter of national concern it is the duty of the Dominion Government to take it in hand; but as education is strictly within the jurisdiction of the provincial Governments we should look to them and the legislatures for the relief of a situation which threatens to become serious in the near future.

A mechanics' lien for $30,900 has been registered against the Birkbeck Building, on Adelaide street east, Toronto, by the Engineering & Contracting Company, of Baltimore, who have lately completed the erection of the building for the Birkbeck Investment & Savings Company. The structure, which is one of the finest office buildings of its dimensions in Toronto, has cost nearly $150,000, and the owners are entitled to withhold payment of 15 per cent. of the cost for 30 days after completion, so that the amount the contractors could claim for immediate payment is very small. Enquiries as to the reason for the registration of the lien failed to elicit anything very convincing. It appears that the work has not been carried through by the original architect, but the present one is said to admit the fulfilment of the contract, with perhaps the execution of some trifling extras amounting to about $2,000.

[Note.—Contributions suitable for publication in this Department are invited from subscribers and readers.

A Plea for Hot Air Heating.

There is no denying the fact that in many parts of the country a strong prejudice exists against warm air heating, said Mr. E. H. Roberts, of Minneapolis, in a recent paper before the Midland Club. It is claimed by many that furnaces are dusty and dirty; that they will not heat the sides of buildings most exposed to the winds; that they are extravagant in fuel, short-lived, and at best a temporary expedient, excusable only on the ground of the owner's inability to afford anything better.

This attitude of the public mind toward warm air heating might in a measure be explained as a result of clever advertising on the part of the boiler manufacturers, but the fundamental trouble is that a great many furnaces do smoke and gas and throw dust into the rooms and burn double the fuel they should; in fact, they act precisely as the enemies of warm air heating claim all furnaces do; and how is it possible to convince a community that furnace heat is superior to all other kinds when nearly every furnace in the neighborhood is a striking example of how successful a warm air furnace may be for cold storage purposes?

Now I need not waste time in trying to convince you that the failures of most warm air furnaces are not due to defects in construction or to any inherent weakness in the system of warm air heating. Every man here has probably known instance after instance where his furnaces have been condemned, and possibly thrown out, simply as a result of ignorance or carelessness on the part of the workmen who installed them.

Manufacturers Must Do Educational Work.

You as manufacturers may disclaim any responsibility for the blunders of the men who place your apparatus, but you cannot escape the consequences, and, in my opinion, if warm air heating is to be restored to its rightful position as the most economical, satisfactory and sanitary system of heating for residences of average size and for many kinds of public buildings, something must be done to enlighten the furnace dealers of the country regarding the essential requirements for successful installation.

I do not mean by this that absolute rules can be laid down that will enable any man of average intelligence to install any kind of a warm air plant in any sort of building. The fact is that, in order to determine the most economical and feasible method of installing a warm air plant, it is necessary to first make a careful study of the building to be heated, taking all the conditions into consideration.

There are, of course, certain rules which may help, in a general way, to prevent the most disastrous mistakes, and yet nowhere is the old saying—that a little knowledge is a dangerous thing—more apparent than in the realm of warm air heating. Even the proper size of the furnace depends so much upon the character of the building, the air supply, the arrangement of the warm air connections, the climate, winds, etc., as well as on the construction of the furnace itself, that it would be exceedingly difficult, if not impossible, to devise any general rule along this line that would not be more likely to make trouble than to prevent it.

Source and Amount of Air Supply.

Again, there is the question of the air supply, on which it would be hard for furnace men to agree. In the South, East and extreme West outside air seems to be quite satisfactory, while in the North and Middle West practical experience has shown that it is impossible to secure satisfactory results or a reasonable economy of fuel without using inside air circulation, and is it not ridiculous to expect a warm air furnace to continuously raise the temperature of the air from 30 to 40 degrees below zero to 70 degrees above with no more fuel than would be required for a hot water plant in the same building that simply maintains a 70-degree temperature without any change of air?

And yet there is perhaps no one thing that has led to more furnace failures than the use of inside air for cold air supply. In the first place, the amount of inside air supplied to the furnace is almost always inadequate. Oftentimes I have seen furnaces with warm air outlets aggregating 500 to 600 square inches supplied with only 100 or 200 inches of cold air, and even this miserable allowance so retarded by circuitous windings that it had apparently become discouraged and had given up as futile the attempt to reach its destination.

If my time and your patience were inexhaustible I would be glad of this opportunity to mention more of the causes for failures in warm air heating that have come to my notice; and I would also like to outline some of the points which I have found essential to success; for instance, an arrangement of the cold air returns for residence work that will satisfy the owners, and at the same time secure the best results; likewise, the advantage of using a single basement pipe to heat two or more rooms, and the best method of using outside air in conjunction with the inside cold air supply, etc.

I would like to divide the subject of warm air heating and discuss separately the best methods for heating the various kinds of buildings. And right here it might not be out of place to say that in my opinion there is no class of buildings where superiority of warm air heat can be more clearly demonstrated than in school houses of from six to ten rooms; nevertheless, school heating with warm air furnaces has even a less enviable record than furnace heating in residences. But for the school house failures the architects are more often at fault than the dealers, for frequently with no practical knowledge of warm air heating or ventilation they insist upon embodying the heating and ventilating systems in their plans, and some of their layouts, as you know, are so impracticable as to be positively ridiculous.

Support Advertising by Scientific Installation.

Now, I am a believer in advertising and realize that "the man who whispers down a well about the goods he has to sell won't reap the shining silver dollars like he who climbs a tree and hollers." But to be permanently successful, advertising must have back of it something more than plausible ideas, and if this campaign of advertising, which, I understand, has been proposed, is to bring returns which are commensurate with the cost, furnace manufacturers must see to it that their apparatus is so installed that it will give complete satisfaction. It is all very well to dwell on the fresh air features of furnace heating and to call attention to the fact that in the State of New York alone fifty regiments of men, women and children go down to death every year as the direct result of lack of ventilation in homes and public buildings; you may prove beyond the shadow of a doubt that fresh air will do more to aid digestion than all the remedies in the materia medica, and that it is a greater tonic than all the millions of bottles of patent nostrums that are consumed each year by a credulous and ailing public at $1 a bottle. But the warm air furnaces which you advertise must do satisfactorily and economically the work for which they were primarily intended, or an unappreciative public will surely insist upon having something else that does, and no amount of advertising on your part will avert this inevitable consequence.

Architects and Furnace Men Ignorant of Furnace Heating Details.

Someone—I believe it was Socrates—once made the remark that against ignorance and prejudice even the gods are powerless. Undeniably, furnace manufacturers are up against both these conditions, for dealers and architects generally are ignorant of the most essential features of warm air heating, and the public in many localities are prejudiced against warm air furnaces; but where the gods of the ancients are reported to have failed I believe we may reasonably hope for eventual success if we persistently and consistently pursue a campaign of education for dealers and architects alike, and by actual demonstration, as well as argument, convince the public that warm air is the most logical, practical and satisfactory system for heating homes and many kinds of public buildings.

Modern Methods of Lavatory Plumbing.

Lavatories, or wash basins for the face and hands, have become a necessary plumbing attachment of the modern home, says "Shoppell's Magazine." As a rule round basins are used, but the oval pattern is becoming more and more popular. This latter pattern allows more elbow room and also a larger opening, thus lessening the splashing of water over the slab or floor. Three kinds of marble are used in setting lavatories. The kind known to the trade as American is soft and white and easily stained, while it absorbs greasy matter readily. The Italian marble is hard, veined and white, will take a fine polish but stains, though not so readily as the American marble. The marble known as Tennessee stone is very hard, procurable in dark colors only, and very desirable for lavatories on account of its small liability to stain or absorb greasy or oil matter.

The basin of the lavatory should be set up open, on brackets or legs, and all pipes should be exposed. This method will allow leaks to be readily detected, will promote cleanliness and ventilation and ensure better workmanship by the plumber. The basin should be set 28 to 30 inches from the floor to the top of the marble and provided with a back, or spatter protector, 12 to 16 inches high and extended the length of the top. Bevelled or O. G. edges make a desirable finish, although a roll-rim effect, to compare with the bath tub, is now much in favor.

In attaching a basin to a slab three or four holes are drilled on the under side and a special screw with expanding head is inserted. This screw is provided with a clamp and nut, and after wetting and spreading evenly plaster or cement, the nuts are tightened and the basin is firmly attached and suspended when in its proper position. Plaster or cement is used in preference to putty or white lead because the oil in the latter would become absorbed and stain the marble through to its polished surface. Plaster, repeatedly wetted, will soon wash away, thus loosening the joint and allowing the splattered water to run between the slab and bowl and thence to the floor, which is very annoying. Cement, mixed with plaster, about half and half, is more desirable than plaster alone.

The edges or flanges of the earthenware basins are seldom perfectly true, being warped somewhat in baking. Therefore such flanges should be ground to a flat, level surface in order to make a satisfactory joint between the marble and the basin. The overflow is the weak point about a lavatory basin as usually installed. When the ordinary basin is discharged the waste backs into the overflow, fouling it and allowing the filth thus deposited to discharge its offensive odors into the room. A basin should be without mechanical parts in the waste pipe, either inside or outside the bowl, as they frequently get out of order and all fouling surface for the adhesion and accumulation of filth. No basin should be used which has concealed spaces with which the washing water can come in contact while being used. The siphon basin is now considered the most desirable form as its contents are discharged by siphonic action, and the trap will always be clearer, owing to the powerful flushing and scouring force caused by the rapid discharge. By lifting the plug and immediately dropping it back into place the water is forced to rush out through the overflow that connects with the waste pipe below the plug.

If by accident or design faucets are left open the water, after attaining its proper level, finds free access through the outlet, and, if the overflow continues, a siphonic action is produced, thus causing a rapid discharge of the bowl contents and preventing an overflow. The siphonic action prevents the clogging of the waste, as it clears out matter such as hair, lint, etc., with its thorough scour. Basin cocks of various patterns are on the market and they can be procured as ornamental or expensive as may be desired.

The outlet of a basin should be at least 1¼ inches in diameter, although nearly all manufacturers make them smaller unless orders are given to the contrary. The wase pipe and trap should be not less than the outlet in diameter. With the combined slab and basin in one piece of crockery, with standard of porcelain, with proper sized outlet, a very sanitary appliance is produced which should satisfy the most fastidious home owner.

Up-to-Date Plumbing Systems.

The subject of sanitation is receiving more attention to-day than at any previous time in the history of architecture. The increased size of living rooms, the provisions made for ample light and air, and the introduction of ventilation in connection with the heating system have done much; but more particularly there has been a wonderful improvement in plumbing, both in regard to the drainage system and to the water supply.

Improvement in workmanship, materials and installation have so changed the character of plumbing that new standards of comparison are required to determine the quality of work. For instance, while formerly plumbing fixtures were hidden in an ill-ventilated, out-of-the-way place, they now occupy a prominent place in the home of the intelligent, and have become an ornament as well as a necessity. Improvements in the fixtures consist mainly in the substitution of porcelain enameled ware for the plain iron, copper, earthenware and wood formerly used; also in the prohibition of all mechanical closets.

Improvements in the system of drainage within a building, consist of the use of properly proportioned piping, the sizes of pipe being determined by calculation instead of by guess as of old. The perfection of a system of ventilation to keep the air within the drains comparatively pure, improvements in the shape of fittings, increased weight and better quality of pipe used, and the better methods of joining the pipe, all contribute their share to the improvement of the system as a whole.

Investigations have shown that more disease enters a building through the water supply than from the drainage system. Certain precautions are taken to minimize the danger from this source. The source of water supply is selected where there is the least danger of contamination or infection, and care is taken to protect the water from pollution while in storage. Also ample time is allowed for sedimentation and for the sunlight to remove the bacteria before the water is delivered into the distributing mains.

In some places the municipal supply of water is filtered through germ-proof filters before it is delivered to the consumers. Where this is not done separate house filters can be installed by the consumers for their own protection.

Some good points to bear in mind when figuring on installing sanitary plumbing are:

First—The types of fixtures are the best that are made of porcelain enamel and are set open and located in well-lighted and properly ventilated rooms.

Second—There should be an adequate supply of water, sufficient in volume and pressure to supply and flush the various fixtures.

Third—The system of ventilation should be so planned as to properly ventilate every portion of the drainage system.

Fourth—A quality of piping should be used that will neither corrode easily or be affected by sudden changes of temperature; the joints should be made as strong as the pipes themselves.

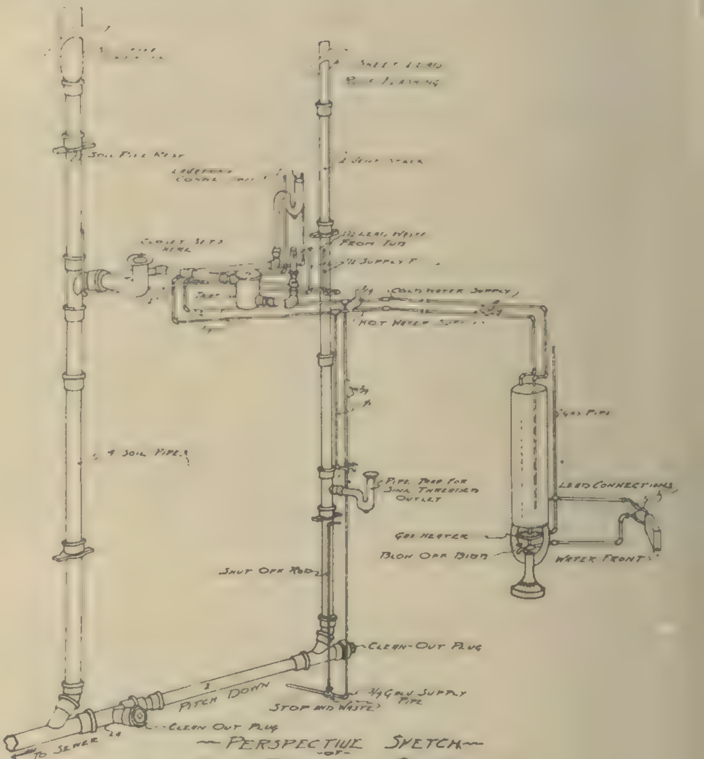
Fifth—Waste pipes should be large enough to carry off all waste matter discharging into them, and yet not so large as not to be self-cleaning.

Sixth—The system should be uniformly supported throughout its entire extent so that it can neither settle nor swing, nor pull on any of its branches.

And seventh, the system should be so installed that turns and offsets are at easy angles so as not to interrupt the flow of sewerage in the main; clean-outs should be provided at such points that the inside of the drainage system is accessible throughout.

You will find illustrated in the accompanying perspective sketch the correct method of roughing-in for a plumbing system in a residence located in suburban or rural district, where ventilating ordinance, or rather ordinance covering the reventing of all fixtures, is not in effect. It is sufficient that the system be installed with the ordinary vent stacks where a private sewerage system is installed. However, if more than one family were using the same line of sewer, it would be necessary to vent the various fixtures. In this house the kitchen sink is located on the same side that the bath room is, but is a room farther back and is on the first floor. The range boiler is located at the other side of the kitchen, as is shown, with water front and properly let connections from the range to same. There is also acetylene gas connection made to this range boiler, or rather connected under it, so that any time the range fire is not wanted and hot water is desired, same can be procured in a few minutes by the use of this heater.

The bath room is located on the second floor, a room farther front than the kitchen. It was therefore necessary to install this job with two ventilation stacks, one 2-inch stack for the sink and one 4-inch for the bath room fixtures. This 4-inch stack is connected at the bottom into a Y branch so that all matter passing down this stack can flow in the direction it is intended to go and thereby prevent any stuffing up or blocking of the sewer. Clay sewer pipe must never be used inside the foundation walls, as it is too liable to be cracked, from which crack sewer gas would escape into the basement. All lead work that possibly can be used should be installed and thereby prevent any leakage from bad joints or from rusting out of galvanized pipe between floors. Unless galvanized pipe is filled with water constantly it will corrode very rapidly, and in most cases will not last more than two years. You can therefore see that much time, expense and patience can be saved by installing lead work. The using of galvanized pipe for water service is very satisfactory if the pipes are constantly filled, thereby preventing and chance for air to cause corrosion. —P. W. Rathbun, in the "American Carpenter and Builder."



—PERSPECTIVE SKETCH—
OF
—COMPLETE PLUMBING SYSTEM—

The sand and gravel producer had his full share of business last year. Most of the plants which are properly equipped in this line have increased their capacity and still found plenty of business on the larger scale. In fact, they have never increased their capacity until after they had the orders

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Have confidence in yourself; get hold of the idea that you can do as well as your competitor, and then prove it.

Public Works Estimates for the Current Year

Cost of Work Planned for Railways, Canals, Public Buildings, Harbors, etc.

A statement of the estimated expenditure of the Dominion Government for the fiscal year ending March 31, 1910, has been presented to the House of Commons. The items include the following for public works:

RAILWAYS AND CANALS—CHARGEABLE TO CAPITAL.

Railways.

Intercolonial Railway:—Towards double tracking parts of line, $69,000; improvements at Mulgrave, $22,000; improvements at Loggieville, $25,500; to increase accommodation at Truro, $52,000; to increase accommodation at Pictou, $5,500; cut off line at Moncton, $50,000; improvements at North Sydney, $4,000; to strengthen bridges, $70,000; improvements at Sackville, $10,000; to increase accommodation at Halifax, $180,000; diversion of line, Sydney Mines to River George, $50,000; diversion of line at Chatham and branch to wharf, $36,000; locomotive and car shops with equipment and new freight yard at Moncton, $400,000; new turntables, $13,000; to increase water supply, $74,700; to increase accommodation and facilities along the line, $133,000; increased accommodation at Ste. Flavie, $5,000; improvements at Ste. Rosalie, $55,000; engine house, etc., Chaudiere Junction, $20,000; improvements at Drummondville, $5,000; engine house, machine shops, etc., at Riviere du Loup, $158,500; improve- overhead crossing at Proberts, about two miles north of Londonderry station, $5,000; to provide a subway crossing at East- $64,500; improvements at Point Tupper, $4,000; to provide an ments at Newcastle, $10,000; improvements at Campbellton, ville, about one mile south of Londonderry station, $10,000; rolling stock, $170,550; new machinery for locomotive and car shops, $95,800.

Prince Edward Island Railway:—Branch line, Hormany to Elmira, $50,000; to increase accommodation at Charlottetown, $194,000.

National Transcontinental Railway:—Surveys and construction, $20,000,000.

Hudson Bay Railway:—To provide for the survey and location of a line of railway from the Saskatchewan River to Hudson Bay, $65,000.

Canals.

Lachine Canal:—To complete wharf and basins, $150,000; to stop leaks on north bank at Cote St. Paul, $29,000; building new wall, north side, $56,000; testing cement, $2,500.

Soulanges Canal:—Stopping leaks, trimming slopes, etc., $160,000.

Chambly Canal:—Completing power house at lock No. 2, $4,000; St. John's harbor improvements, $44,000.

Ontario—St. Lawrence Canal:—District office, $7,000.

Galops Canal:—Upper entrance, final estimate, $2,350.

St. Lawrence River:—Removal of shoals in river, upper entrance Galops Canal, $30,650.

Trent Canal:—Construction, $1,000,000.

Welland Canal:—Electric lighting and power plant, $8,000; to widen canal near Welland, $40,000; Port Colborne, improvements, $65,000; surveys, $10,000; dock, south of Welland, $40,000; siding to Port Colborne elevator, $21,000.

Sault Ste. Marie Canal:—Construction, $50,000.

Summary:—Intercolonial Railway, $1,798,850; Prince Edward Island Railway, $244,000; National Transcontinental Railway, $20;000,000; Hudson Bay Railway, $65,000; Canals, $1,720,300.

RAILWAYS AND CANALS—CHARGEABLE TO INCOME.

Canals.

Sault Ste. Marie Canal:—Rebuilding north entrance pier, including dredging, $68,000.

Quebec Canals:—Remarking boundaries, surveys, etc., to complete, $5,500; dredging, $18,000.

Lachine Canal:—Wall north side Basin No. 2, $70,000.

Soulanges Canal:—Increasing concrete base of mooring posts, $2,300.

Beauharnois Canal:—Building stone protection for clay dyke, $1,500; macadamizing road, Hungry Bay dyke, $11,000; extending protection wall at Hungry Bay, $15,000.

Chambly Canal:—Macadamizing towpath, $5,500; replacing old wooden road bridges, $1,100.

St. Ours Lock:—Renewing boom piers, $3,600.

Carillon and Grenville Canals:—Completing repairs to gap in Carillon dam, $40,000; macadamizing public road along old canal, $7,500.

Ste. Anne's Lock:—Renewing old wooden bridges over road slips, $2,500.

Cornwall Canal:—To repair wash-out, $55,000; to repair north bank between locks 18 and 19, $5,000.

Galops Canal:—To build concrete superstructure and bridges for piers at upper entrance, $40,000.

Rideau Canal:—Rebuilding bridge at locks, Jones' Falls and Washburn, $3,000; to rebuild long bridge at Kingston Mills, $7,500.

Trent Canal:—Improvements, $50,000.

Welland Canal:—To renew entrance piers, Port Maitland, $65,000; stone protection to banks, $10,000; heavy repairs, $10,000; to renew foundations of Junction lock, $8,000; to build new steel gate lifter, $12,000; to renew bridge over raceway, lock No. 2, old canal, $1,500; to renew three Feeder bridges, $3,000.

PUBLIC WORKS—CHARGEABLE TO INCOME.

Public Buildings.

Nova Scotia:—Amherst Public Building, improvements, $2,000; Bridgewater, public building, $6,000; Glace Bay, public building, $12,000; Guysboro' public building, improvements, $1,200; Halifax Dominion building, improvements, repairs, etc., $75,000; Halifax Dominion buildings, improvements, etc., $4,000; Halifax, immigrant detention building, hospital, $2,500; New Glasgow public building, improvements, $1,000; Pictou public buildings, renewals and repairs, $2,000; Shelburne, public building, $19,000; Westville, public building, $5,000.

Prince Edward Island:—Georgetown pub. building, $7,000.

New Brunswick:—St. John Dominion buildings, improvements, repairs, etc., $4,000; St. John drill hall, $12,500; St. John quarantine station, Partridge Island, water service, and improvements and repairs to buildings, etc., $3,000; Tracadie lazaretto, laundry and sanitary works, $2,000.

Maritime Provinces, generally:—Dominion public buildings, renewals, improvements, repairs, etc., $15,000.

Quebec:—Cookshire post office, $15,000; Dominion public buildings, renewals, improvements, repairs, etc., $20,000; Grosse Isle, quarantine station, improvements and repairs to buildings and fittings, furniture, etc., $5,000; Joliette armory, $15,000; Knowlton, public building, $12,000; Lachute, public building, $7,000; Magog public building, $14,000; Montreal, Eastern Postal Station, $10,000; Montreal, examining warehouse (old), new roof, alterations to freight elevators, repairs, etc., $20,000; Montreal, General Post Office, enlargement, additions and alterations, including fittings, furniture, etc., $127,000; Montreal, new postal station at Point St. Charles, $40,000; Montreal public buildings, improvements, alterations and repairs, $8,000; Pierreville public building, $2,000; Plessisville public building, $18,000; Quebec Citadel, drill shed for school of gunnery, $45,000; Quebec immigration buildings, additions, repairs and fittings, $13,000; Quebec post office, elevator improvements, repairs and fittings, $13,000; Quebec East public building, $50,000; Quebec Urovince, immigrant buildings generally, $5,000; St. Johns Public building, $6,000; Sherbrooke drill hall, $45,000; Three Rivers new public building, to replace building destroyed by fire June 22nd, 1908, $40,000; Valleyfield public building, improvements, $2,000.

Ontario:—Belleville armory, $15,000; Brantford drill hall, to provide for Government share of cost of bithulithic pavement to be laid and storm sewers to be built by the municipal authorities, $3,000; Cornwall public building, alterations to fittings, etc.; $1,400; Dominion public buildings, renewals, repairs, improvements, etc., $20,000; Fort William public building, enlargement of, $11,000; Glencoe public building, $26,000; Hamilton drill hall, addition, $37,000; Kincardine, public building, $15,000; Kingston Royal Military College, additional accommodation, $57,000; Kingston Royal Military College, barrack accommodation for stables, $15,000; Kingston Veterinary Hospital, $15,000; Leamington, public building, $23,000; Markham, public building, $10,000; Ottawa, buildings for testing of fuel by Department of Mines, $15,000; Ottawa Departmental buildings, fittings, etc., $50,000; Ottawa

Departmental buildings, improvements in lavatories, plumbing, etc., $10,000; Owen Sound public building, $20,000; Parkhill public building, $20,000; Peterboro' armory, $37,000; Renfrew, public building, $16,000; Simcoe, public building, $20,000; Toronto Dominion buildings, improvements, renewals, erpairs, etc., $5,000; Toronto drill hall, additional renewals, repairs, etc., $5,000; Toronto drill hall, additional accommodation for new corps and armories, $25,000; Toronto Meteorological Observatory, $44,000; Toronto military buildings, magazine, $1,500; Toronto Post Office, additions and alterations, furniture, fittings, etc., to make good damage by fire, April 29th, 1906, $25,000; Welland, public building, $33,000; Whitby, public building, $28,000.

Manitoba:—Dauphin public building, $24,000; Dominion public buildings, renewals, improvements, repairs, etc., $10,000; Emerson, public building, $31,000; Neepawa, public building $20,000; Winnipeg Dominion buildings, improvements, repairs, etc., $5,000; Winnipeg examining warehouse (new), $175,000; Winnipeg Post Office building (old), fitting up ground and first floors, $25,000.

Saskatchewan, Alberta and Northwest Territories:—Dominion public buildings, renewals, improvements, repairs, etc., $10,000; Edmonton public building, $75,000; Estevan public building, $25,000; Lethbridge Custom House and Dominion Lands office, new heating apparatus, sanitary works, plumbing, etc., $4,000; Maple Creek, public building, $10,000; Prince Albert, Saskatchewan penitentiary, $65,000; Saskatoon public building, $32,000; Yorkton, public building, $31,000.

British Columbia:—Dominion public buildings, renewals, improvements, repairs, etc., $8,000; Fernie public building, $25,000; Ladysmith, public building, $17,500; Prince Rupert, quarantine station, $25,000; Vancouver, public building, $60,000; Victoria immigration building, $43,000; Victoria Post Office, etc., alterations and additions, $3,000; Williams Head quarantine station, improvements and repairs to buildings, and fittings, furniture, etc., $5,000.

Yukon Territory:—Dawson, Yukon Commissioner's residence, $19,000.

Public Buildings, generally:—Construction of armories, $50,000; Experimental Farms, new buildings and improvements, renewals and repairs, etc., in connection with existing buildings, fences, etc., $10,000; fire escapes for Dominion public buildings, $5,000; public buildings generally, $10,000.

PUBLIC WORKS—CHARGEABLE TO CAPITAL.

Public Buildings.

Ottawa, Astronomical Observatory, additional buildings etc., $14,000; Ottawa, new departmental buildings, $125,000; Ottawa, Parliament Buildings, additions and alterations, $93,000; Ottawa, Royal Mint. refinery, $30,000; Ottawa, Victoria Memorial Museum, $400,000.

Harbors and Rivers.

Port Arthur and Fort William, harbor and river improvements, $600,000; Quebec harbor, deep water wharf at Levis, $400,000; Quebec habor, improvements at mouth of River St. Charles estuary, $280,000; Red River, improvements at St. Andrew's Rapids, $600,000; St. John harbor, improvements, $475,000; Tiffin harbor, improvements, $15,000; Victoria har-French and Ottawa Rivers, $20,000.

Transportation Facilities.

Georgian Bay to Montreal, survey for waterway via bor, improvements, $150,000.

(To be Continued)

The London Concrete Machinery Company, London, Ont., have just published a well illustrated and comprehensive catalogue of their various lines, containing, also, instructions for handling concrete for different classes of work, and figures and estimates of concrete in many kinds of construction. This catalogue illustrates four different types of concrete mixers, concrete block machines, silo block machines, silo curbs, cement brick machines, ornamental porch column and baluster moulds, pier block moulds, lawn vase moulds, headstone moulds, grave post moulds, tile and sewer pipe moulds, rock crushers, sill step and window cap moulds, fence post moulds, hitching post moulds, sidewalk tools, cement working tools, wheelbarrows and many cement working appliances.

Merritton's New Lighting Plant.

The new municipal electric lighting system at Merriton, Ont., is now completed and commenced operation on January 29th. Current is obtained from the Ontario Power Company and on a long-term contract by the town. The town purchased the former electric lighting distribution system and overhauled it and added very considerable extensions. The feature of the new combined system is the introduction of Tungsten street lamps and their control entirely from the receiving station itself by automatic means. This multiple Tungsten system operated by distant control is an entire novelty in municipal lighting, and is especially adapted for towns where cost of copper and of yearly operation must be kept down.

On the occasion of turning on the street lighting system the Town Council invited a number of officials of adjoining towns to see the system and lighting display, which was described as brilliant, as street lighting goes, there being 200 Tungsten lamps on the streets. The adaptation of this system to street lighting required the introduction of specially designed apparatus and controlling devices.

Messrs. K. L. Aitken, who is now City Electrical Engineer of Toronto, and P. H. Mitchell, consulting engineer, Traders Bank Building, Toronto, designed and supervised the installation.

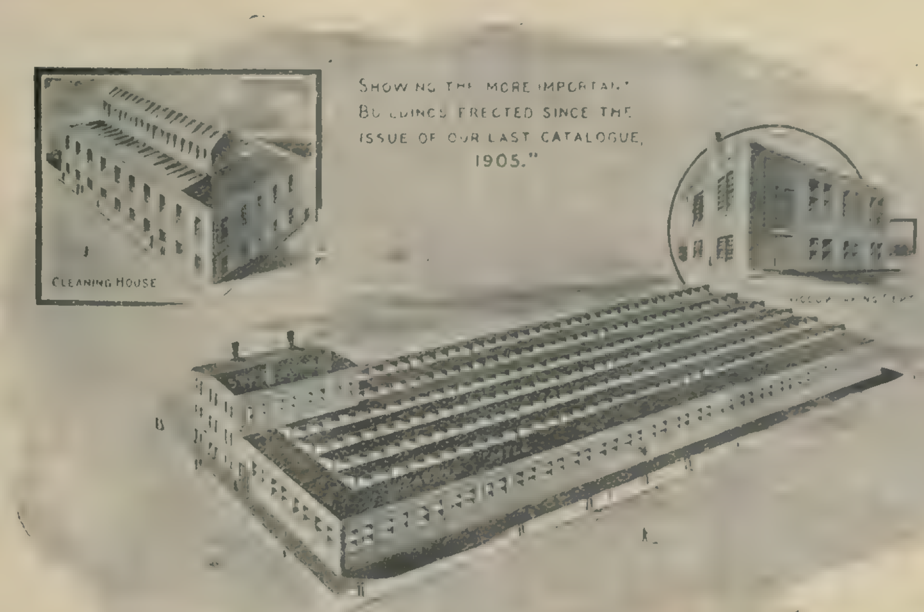
An Important Drainage Project.

An important project for provincial drainage is under consideration by Hon. Dr. Reaume, Minister of Public Works for Ontario, under which it is proposed to utilize the rivers and waterways of the whole province. The project will probably go into legislation at the forthcoming session, but its working out will take a number of years. Under existing conditions the Government has been confronted not infrequently with the question of granting drainage aid to one portion of the country at the expense of another. One district secures satisfactory outlet into a river, only to cause overflow and flooding further down the stream.

The Minister's plan contemplates a Government survey of all Ontario rivers and waterways and a report thereon. Upon the report as to the carrying capacity of the streams, the question of drainage will be tackled from a provincial and not a local standpoint, and the land drainage gauged to the capacity of the outlets.

At a recent meeting of the Town Council of Notre Dame de Grace, Que., it was decided to purchase the property of the company supplying the water to the municipality. Mr. Henry Miles is the seller of the property, and the price named in the council's resolution to purchase is $292,000, payable in debentures, 40 years, bearing interest at 4½ per cent. The supply of water is taken from Lake St. Louis, the power house being situated at Lachine, south of the canal. This aqueduct supplies not only the municipality of Notre Dame de Grace, but Montreal West and St. Pierre (Blue Bonnets). The pumps furnish some 1,500 gallons per minute.

A high-lift centrifugal pump driven by a steam turbine has been built for the Montreal Water & Power Company. The pump delivers 10,500 gallons per minute against a 400-foot head, and has two hydraulically-independent propellers. The turbine is of the Zoelly pattern, giving a maximum of 1,899 h.p. at 1,500 r.p.m., with steam at 165 pounds and 150 deg. Fahr. superheat.


SHOWING THE MORE IMPORTANT
BUILDINGS ERECTED SINCE THE
ISSUE OF OUR LAST CATALOGUE,
1905."
CLEANING HOUSE

View of the Greening Company's Works.

An Up-to-date Hamilton Concern.

Extensive additions have been made to the buildings and plant of the B. Greening Wire Company, Limited, Hamilton, in the last 18 months. Illustrations of some of the additions are published herewith. The new weaving mill, which is probably one of the best structures of its kind in Canada, is 260 feet long by 130 feet wide. At the end, there is what appears to be a temporary enclosure. This will be removed, and further extensions made, as soon as trade warrants it. The building is devoted entirely to wire weaving machinery, and it is interesting to see the ponderous looms, some of them over 15 tons in weight, making, with apparent ease, extremely heavy smoke stack netting, mining screens, etc., as wide as 72 inches; and the fast running smaller looms engaged in making meshes as fine as No. 70 of brass wire for sleeping car ventilators.

The other buildings shown are the wire mill, the cleaning house, which has a capacity of 50 tons per day, and the carpenter shop, which is isolated from the other buildings, the increased yard room being used for the different kinds of lumber.

There are many other interesting features of this industry, a few of which are: Wire rope spinning, wire drawing and galvanizing, poultry netting twisting machines, press perforating of all kinds of metals for all purposes, wire chain making by automatic machines for Greening's chains, etc. These latter processes are carried on in the older buildings.

The building operations in Toronto for the month of January were not as active as during the same month last year. The approximate value of buildings for which permits were granted was $380,025, as compared with $474,453 last year. The number of permits, however, shows an increase, there being 151, as compared with 109 last year. There were 220 new buildings involved in the permits, as compared with 128 last year.

Canal to Connect Lakes Erie and Ontario.

Mr. J. G. Sing, Government Engineer, made a recent statement to the effect that a new canal connecting Lakes Erie and Ontario was contemplated. He said:

"It may be said on good authority that a new canal is likely to be built from Lake Erie to Lake Ontario, with locks 700 feet by 75 feet, with 24 feet of water on the sills, and the number of locks reduced to six. If this is done, the largest vessels will be able to enter Toronto harbor." Mr. Sing said the lake waters were lowering, and this was a serious sign, as it would be detrimental to the harbors. On this account, he argued, the effect of such works as the Chicago drainage canal and the development of power plants using much water should be carefully considered, and if possible compensating works established. He characterized the Georgian Bay Canal project as one of the biggest in the world. It would cost $100,000,000, and 45 dams would have to be built. He stated that the Dominion Government intended to make a 30-foot channel from Montreal to the sea.

It is stated that the architects of Winnipeg have prepared and have in preparation plans for over $12,000,000 worth of buildings for 1909. With money becoming much easier than it has been for the past two years contractors are taking advantage of the low prices on materials and are placing tenders that justify a healthy outlook for the early spring. The labor market is very much overcrowded, and in view of the fact that the building season will not open up for some months yet, Winnipeg cannot offer the least inducement for labor men at present.

The new Y.M.C.A. institute at Calgary, Alta., was opened last month. Built of sandstone, at a cost of $100,000, the building is one of the most complete of its kind west of Toronto.

Reduced Rates by all Railways
to the
First Annual Canadian
Cement Show
will be held at the
St. Lawrence Arena,
King St. East, Toronto
March 1st-6th, 1909
under the auspices of the
Canadian Cement and
Concrete Association

The Exhibit will comprise:—
Cement, Cement Products and Machinery, Reinforcing Materials, Builders' and Contractors' Supplies, and all Associated Lines

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than in any other publication. A moderate expenditure in the advertising of proposals will convince you of the service that the CONTRACT RECORD can give you. When you have "Tender" advertising to place do not forget that this paper carries more advertising of this sort than any other journal. CONTRACT RECORD, Confederation Life Building, Toronto.

Cement and Concrete Association's Convention

An attractive programme has been prepared for the convention of the Canadian Cement and Concrete Association which is to be held in Toronto from March 1st to 6th. Among those who will address the convention are: Richard L. Humphrey, Engineer-in-Charge of the United States testing laboratories at St. Louis, Mo.; Sanford E. Thompson, of New Highlands, Mass., who will address the convention on the "Selection of Materials for Concrete"; F. A. Norris, Boston, Mass., who will speak on "Decorative Concrete in Building"; Capt. John Stephen Sewell, of the War Department, Washington, D.C.; Mr. A. M. Campbell, Deputy Minister of Public Works, Toronto; Walter J. Francis, C.E., Montreal, who will give a paper on "Reinforced Concrete"; Mr. Morssen, C.E., who will talk on "Reinforced Concrete in Europe"; F. Barber, York County engineer; C. W. Cadwell, Windsor, Ont.; A. Larson, chemist, Owen Sound; C. R. Young, Toronto University; E. Brown, McGill University; A. W. Birdge, Toronto, and J. C. Chadsey, Toronto.

The following have taken space at the exhibit:

Peerless Brick Machine Co., 13 N. 6th street, Minneapolis, Minn.; Wadsworth-Howland Co., 84 Washington street, Boston, Mass.; F. M. Jackson, Akron, N.Y.; Thorn Cement Co., 601 Continental Life building, Toronto; Sun Portland Cement Co., Owen Sound, Ont.; Oneida Community Co., Oneida, N.Y.; "Canadian Concrete Review," 62 Church street, Toronto; Concrete Engineering & Construction Co., 19 Wellington street, Toronto; Concrete Publishing Co., 63 Newberry Building, Detroit, Mich.; Multiplex Concrete Machinery Co., 745 Ohio Building, Toledo, O.; Mussens, Limited, 73 Victoria street, Toronto; London Concrete Machinery Co., 19 Marmora street, London, Ont.; Trussed Concrete Steel Co., 23 Jordan street, Toronto; Industrial Chemical Co., Swansea, Ont.; Roman Stone Co., 100 Marlborough street, Toronto; Canadian Art Stone Co., Toronto; Ideal Concrete Machinery Co., London, Ont.; United States Steel Products Co., 203 Ellicott Square, Buffalo, N.Y.; Koehring Machine Co., Milwaukee, Wis.; Brantford Roofing Co., Brantford, Ont.; Expanded Metal Co., Toronto; National Portland Cement Co., Durham; Morssen & Co., 17 Place d'Armes Hill, Montreal; "Construction," Toronto; Cement Tile Machinery Co., Waterloo, Iowa; Montreal Rolling Mills Co., Montreal; W. D. Beath & Co., 193 Terauley street, Toronto; Galt Art Metal Co., Galt, Ont.; Goold, Shapley & Muir Co., Brantford, Ont.; Canadian Portland Cement Co., Temple Building, Toronto; Marblecrete Producets Co., Akron, N.Y.; Senator Mill Manufacturing Co., Galt, Ont.; Wettlaufer Bros., Mitchell, Ont.; Canadian Ornamental Iron Co., Toronto; B. Greening Wire Co., Limited, Hamilton, Ont.; Imperial Plaster Co., Toronto; Bowman & Connor, 36 Toronto street, Toronto; "Contract Record," Confederation Life Building, Toronto; Clark & Monds, Toronto; The Terrano Flooring Co., Toronto and Montreal; Brown Hoisting Machinery Co., Cleveland, O.; Bremner Manufacturing Co., Alpeno, Mich.; A. B. Ormsby Co., Toronto; Stinson Reeb Supply Co., Montreal; Simpson Cement Co., Columbus, O.; Ransom Concrete Machinery Co., Dunallen, N.J.; Canada Wire Goods Co., Hamilton, Ont.; Robert Hunt & Co., Chicago, Ill.; Hobbs Manufacturing Co., London, Ont.

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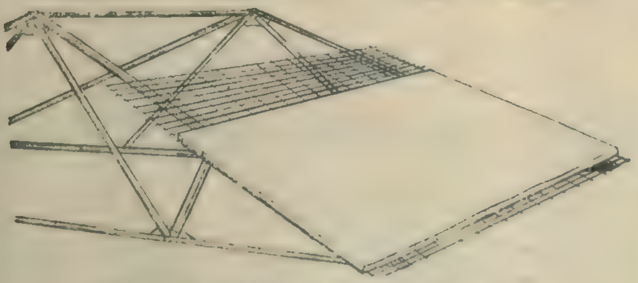

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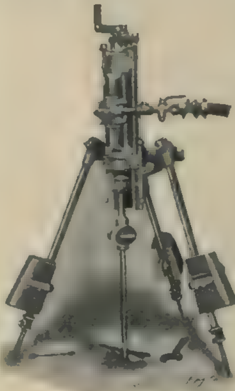

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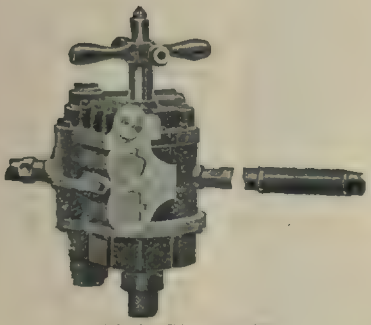

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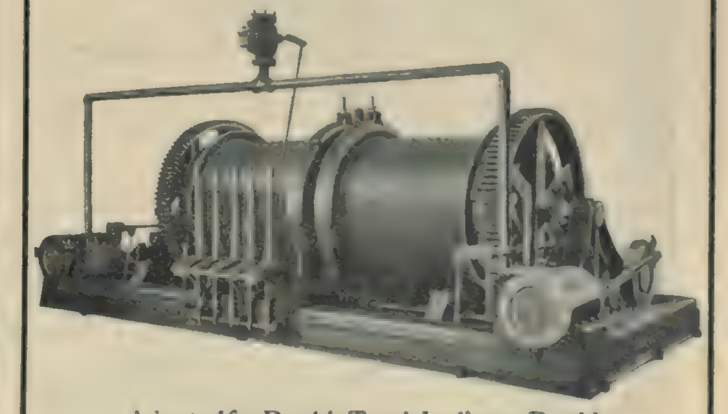

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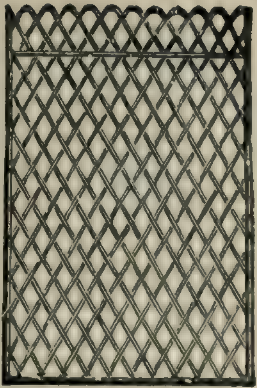

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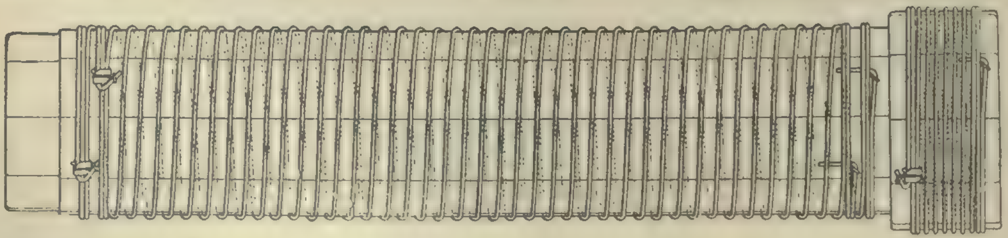

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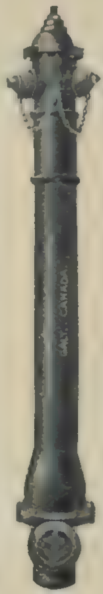

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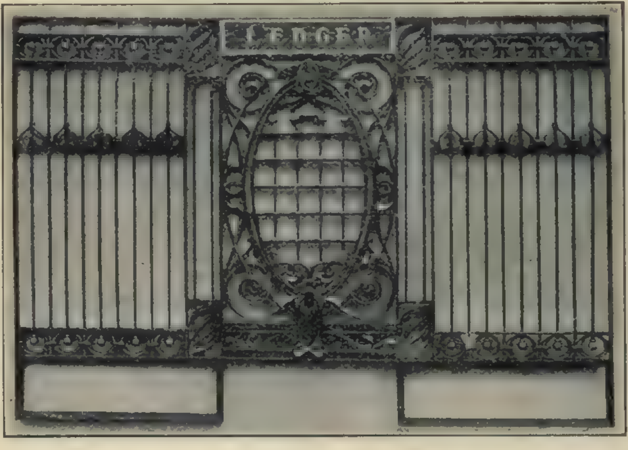

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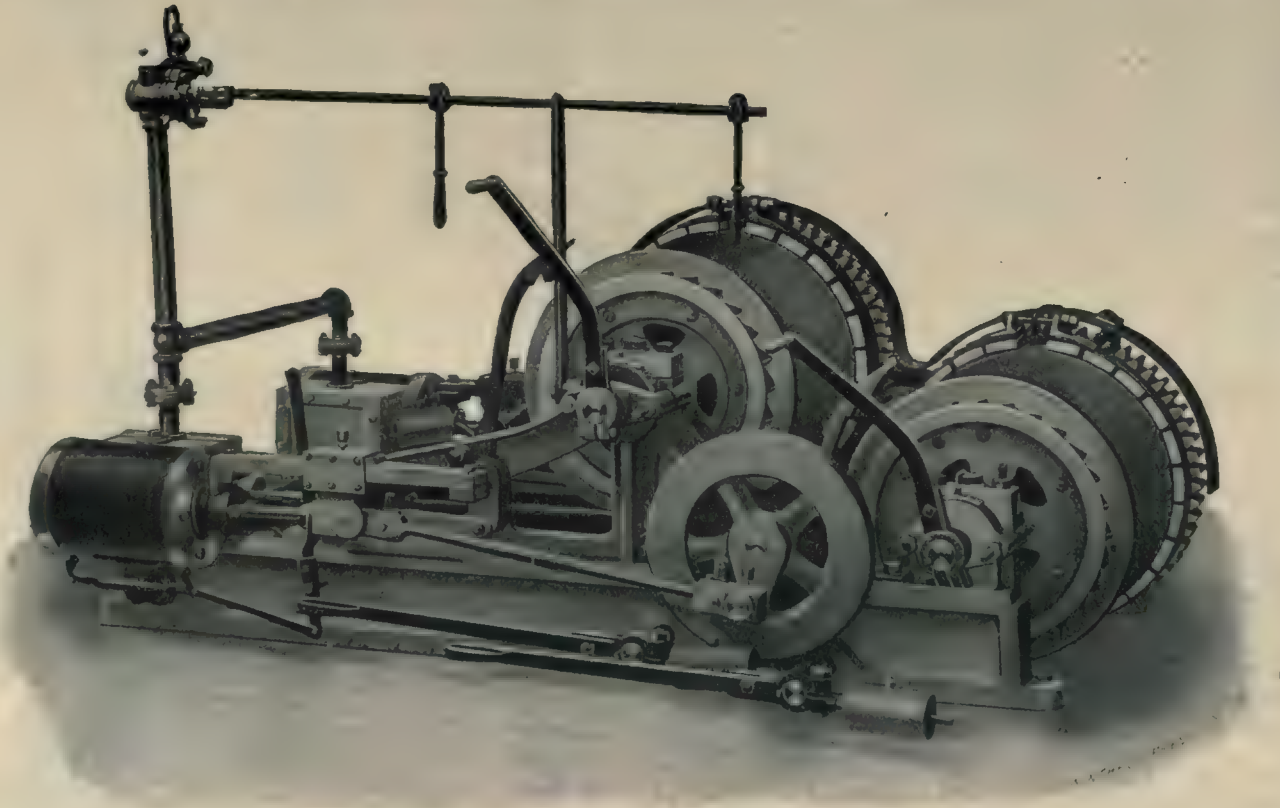

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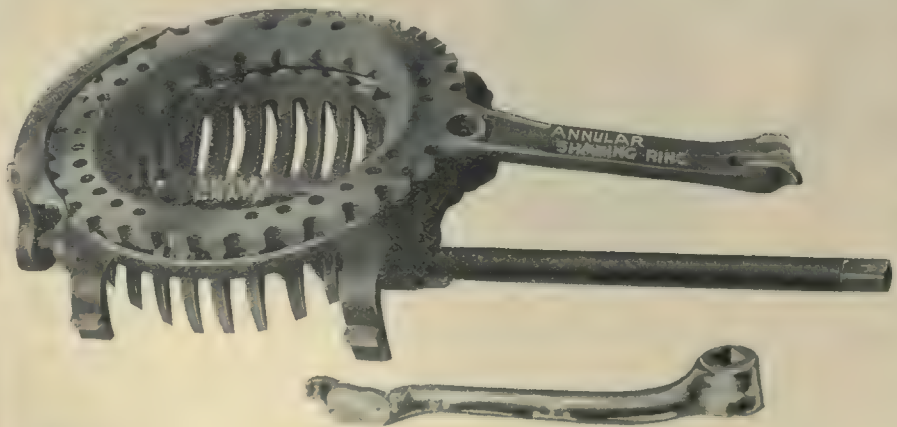
New Idea Duplex Grate

A furnace cannot be a good furnace without a good grate, any more than a "skscraper" can be a good building without a good foundation.

The grate is the feature that regulates the fire and decides how well or how ill it will burn.

The circle formed by the New Idea Duplex Grate reflects heat to the sides of the ash pit section, heating same thoroughly, which in turn heats the air as it comes into the furnace casing before it strikes the firepot and upper section of the furnace, thus assisting materially in **increasing the capacity and life of the furnace, and saving fuel.**

Further, by the use of this grate, the air is evenly applied to the fire, giving an even flow of heat from the bottom of the fire-pot to the top of the radiator. Even heat gives even expansion, and this is one of the many reasons why New Ideas are long-lived furnaces.



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Montreal **Hamilton** **Vancouver**
Western Branch: Tilden, Gurney & Co., Limited, Winnipeg

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Cobourg, Ont.

It is stated that a mile track is to be constructed upon the property recently purchased by Mrs. Livingstone of New Jersey.

Edmonton, Alta.

At a recent meeting of the council, Frank M. Gray outlined the scheme he is promoting to supply the city of Edmonton with water piped from Pigeon Lake, which is 45 miles southwest of the city, and due west from Wetaskiwin. He proposes to sell water to the city for 7 cents per 100 cubic feet. Pigeon Lake has an area of 37 square miles. It has a catchment area of 106 square miles. Its average depth is 36 feet. Its elevation is 597 feet above Edmonton. By Mr. Gray's scheme it is proposed to install a 33-inch pipe line to Edmonton, with two reservoirs, one at Wizard Lake, which is a few miles north of Pigeon Lake, and another reservoir five and a half miles outside of the limits of Edmonton. The pressure from Pigeon Lake to the service reservoir is 260 pounds per square inch. The pressure from the reservoir into the city mains is 104 pounds per square inch. This latter pressure the present system of mains laid in the city could stand, but to use the direct pressure of 260 pounds would require the installation of high pressure mains in the city.

Montreal, Que.

Plans for the new water intake, which is to be sunk in the middle of the St. Lawrence river, will shortly be submitted to the Water Committee by Superintendent Janin.

St. Catharines, Ont.

A by-law to carry out the construction of paving works on College, Queen, William, James, Academy, Court and Queenston streets, as local improvements, will be introduced on March 8th.

Sydney, C.B.

Estimates were presented to the City Council last week by the City Engineer for the necessary extension of the sewer system and water service. These include, for sewers — ward one, $4,144; ward three, $15,104; ward four, $7,627; ward five, $25,707; water extensions — ward one, $780; ward three, $660; ward four, $1,050; ward five, $800; new hydrants, valves, etc., $2,405.

Toronto, Ont.

It is rumored that a company is being organized to secure the large area of vacant land between the north limit of Beach Park and the south side of Queen street for athletic grounds, and to spend a large sum upon buildings. W. H. Moore and Inspector J. L. Hughes are stated to be interested.

The alternative tenders for brick or concrete sewer construction were recently opened by the Board of Control. The lowest tender was for concrete construction, $19.77 per lineal foot, by the Godson Paving & Construction Company. The lowest brick tender was $33.13, from Mr. A. M. Orpen, for the Canadian Construction Company. The Board decided to hold the cheques of the two tenderers in question, $5,000 each, along with their tenders, and the question of whether the sewer shall be of brick or concrete will not be settled until the English and American sewer experts, who will be in the city soon, report on the matter.

City Engineer Rust states that the Galley avenue sewer cannot be constructed until the by-law for the extension of Galley avenue has had its regular course through the council. This by-law will receive its final reading on March 3rd, and it is expected that the sewer work will be started immediately after this measure has passed the council.

Vancouver, B.C.

City Engineer Clement has had levels taken of the section of the city south of False creek from Alder street to Prince Edward street and extending to Sixteenth avenue, for the purpose of furnishing accurate data when the problem of placing the sewerage of that section on a permanent basis is taken up.

Winnipeg, Man.

At a recent meeting of the Board of Control, the Lombard street sewer was placed on the order paper for immediate construction.

The city engineer will report upon the recommendation of the city store-keeper to purchase 35,000 to 40,000 barrels of cement for use during the summer.

Tenders are about to be taken for 500 to 1,000 cords of cedar for block paving during the summer.

Mayor Evans reported to the Board of Control that the works ordered by the Council to be done or ordered by the Council for tender amounted to $1,728,000, made up as follows: Granolithic walks, $77,000; plank walks, $32,000; asphalt pavements, $1,214,000; macadam pavements, $49,000; block pavements, $56,000; sewers, $210,000; water mains, $87,000.

The special committee have adopted the recommendation of the sub-committee, in connection with the softening plant proposal, not to recommend an expenditure for the erection of a plant at the present time.

AWARDED.

Hamilton, Ont.

The contract for supplying and driving piles at the extension of the Ferguson avenue and Catherino street sewers to and through the revetment walls has been awarded to E. A. Fearnside. The contract price was 27 cents per foot, which includes all work.

Railroads, Bridges and Wharves

Barrie, Ont.

The estimated total cost of the proposed Holland river bridge is $15,400.

Charlton, Ont.

The provincial government has under consideration the question of extending the T. & N. O. Railway from this place to Elk Lake, a distance of 28 miles.

Chatham, Ont.

The C. P. R. will erect an additional engine house. R. Scott is station agent.

Tenders will be received until February 17th by T. B. Carron, Dover South, Ont., for the construction of a steel bridge in the township of Dover, over the Ouellette drain, double span, with steel piles and concrete backing. Plans and specifications may be seen at the Town Clerk's office.

Kingston, Ont.

There is a movement on foot here for the construction of a subway under the tracks of the Grand Trunk Railway. B. B. Kelliher, Montreal, Que., is Chief Engineer, G. T. R.

London, Ont.

Engineer Kelly, of the G. T. R., was recently in this city and stated that plans are under way for the erection of a new station and for considerable improvements in track elevation.

The Grand Trunk coal chutes, together with a number of cars, were partly destroyed by fire last week at an estimated loss of $10,000.

St. Catharines, Ont.

Tenders for repairing foundation lock, No. 2, closed February 16th with L. K. Jones, Secretary, Department of Railways and Canals, Ottawa.

Sydney, C.B.

The estimates recently presented to the City Council include items of $3,500 for a new bridge at Wentworth Creek and Bentinck street, and $8,000 for a new bridge at Whitney avenue.

Truro, N.S.

The Minister of Railways recently stated that it was the intention of the Government to build a new station at Truro, but that it might not be possible to undertake the work this year.

Victoria, B.C.

The Flathead railway bill has been reported favorably to the House and there is every prospect of its being passed. The proposed route of the new line is from a point on the eastern British Columbia rail way at or near the town of Corbin, and thence in a southerly direction as far as the international boundary line, a distance of nearly fifty miles. It follows roughly the course of the Flathead river and some of its tributaries. It is capitalized at $2,000,000.

Vancouver, B.C.

At a recent meeting of the civic harbor improvement company, plans for extensive improvements to the deep water harbor were outlined by Messrs. Hermon & Burwell. The basis of the improvement scheme is the construction of a breakwater two miles in length, at an estimated cost of $1,000,000, computed as follows: Sand, gravel and brush filling for 10,000 lineal feet of breakwater, based on 250 cubic feet of filling per lineal foot of breakwater, at

16 cents per cubic yard of filling, $400,000; riprap work for 10,000 lineal feet of breakwater on basis of 50 cubic yards per lineal foot at $1 per cubic yard, $500,000; cost of temporary trestle and tracks, $100,000.

It is stated that the C. P. R. have plans for the extension of their hotels at Banff, Lake Louise and Glacier.

F. F. Busteed, general superintendent of the Pacific division of the C. P. R., has received word that appropriations totalling more than $2,000,000 have been set aside for work in this division. This includes several large bridges in different parts of the province, yards and general improvements. One of the most important improvements of the season will be the replacing of the bridge at Sisco, on the main line between North Bend and Lytton, with either a steel arch bridge or a Pratt truss, at an estimated cost of $250,000. Plans for this structure are stated to be nearly completed. One or two large bridges will also be constructed in the Kootenay, the cost of which will be over $100,000 each. The large trestle at Porcupine Creek, on the Columbia & Western, will be filled after building a culvert nearly 500 feet in length. A structure near Grand Forks will be replaced with an embankment and culvert, and a trestle at Greenwood will also be replaced with an embankment and steel spans. Work on reconstructing the bridge over the Fraser river at Mission will be continued. Between Vancouver and Kamloops, 26 masonry or concrete arches and culverts will be constructed. Between Kamloops and Laggan, the bridge work will not be extensive, as so much has been done in the last few years that the bridge work on this section has been practically completed. A number of culverts, however, will be rebuilt in concrete. Ten or more bridges will have concrete abutments, replacing piles, and four steel and masonry bridges will be built on the Eagle river. Special attention will be paid to the yards, and extensive improvements will be made in those at Mission Junction, Spence's Bridge and Kamloops, while the North Bend yards will also be enlarged. The company will make extensions to the wharves and buildings at Okanagan Landing and Kelowna, to facilitate the handling of fruit traffic. At Field, a new boiler and engine house will be erected and at Revelstoke and Nelson extensions and repairs will be made to the shops. Among the principal of the minor improvements will be improvements in the handling of freight traffic in this city; increased fire protection, etc.; a station at Merritt, the new coal town on the Nicola branch; ice houses at Vancouver and North Bend; enlargement of the station at Haney, and a number of small freight sheds, section houses and bunk houses at various points.

Winnipeg, Man.
The Railway Commissioners have dismissed the application of the city for an order authorizing it to construct a bridge between Brown and Brant streets over the C. P. R. yards, asking that the railroad company contribute to the cost.

The Bird's Hill Sand Company will construct a short elevated railroad at the city's yards connecting with the C. P. R. track in the west end of the city. The track will be elevated for a distance of 600 yards, and underneath, bins will be erected for the various grades of sand and gravel. Plans for this work have been prepared by Frank Evans, architect.

J. H. Russell, architect, is preparing plans for the erection of a 12-storey office building on Portage avenue and Main street. Construction will commence next month.

Windsor, Ont.
The Board of Works are negotiating with the Michigan Central Railroad for the construction of a new bridge over their tracks in this city.

Walkerton, Ont.
At a recent meeting of the Bruce County Council it was decided to proceed at once with the construction of the Stirton and Southampton bridge. A by-law to raise $20,000 by debentures for this purpose was read a first and second time and postponed until the June session for the third reading.

AWARDED.

Walkerton, Ont.
The Hunter Bridge & Boiler Company have been awarded by the Bruce County Council the contract for the construction of the Stirton bridge at $13,300 for complete bridge, steel and cement work.

Public Buildings, Churches, Schools, etc.

Alberni, B.C.
Tenders addressed to F. C. Gamble, Public Works Engineer, Victoria, B.C., will be received until February 22nd for the construction of a lavatory, septic tank, etc., for the government buildings here. Plans and specifications may be seen at the office of the government agent at Alberni, and at the Department of Public Works, Victoria.

Fort William, Ont.
A site has been purchased on Mary and Christina streets by the Roman Catholic church, who will erect a church and separate school for the western portion of the city.

Hamilton, Ont.
Dr. Roberts, Medical Health Officer, will ask the Board at its next meeting to consider the erection of an isolation hospital.

Ladysmith, B.C.
N. Tessier, Secretary, Department of Public Works, Ottawa, is calling for tenders, returnable March 5, for heating apparatus for the public building at Ladysmith.

Montreal, Que.
It is stated that plans have now been submitted to the City Council for the extension and improvement of the Windsor street station and offices of the C. P. R. Preparations are also being made for the extension of the Place Viger yards.

Plans are being prepared for the erection of three new fire stations to be built on Mill street, Pine avenue and in Mount Royal ward. Chief Tremblay, head of the Fire Department, may be addressed.

Newcastle, N.B.
Tenders addressed to J. E. Lindon, Secretary, Board of School Trustees, will be received until March 1st for the construction of a stone addition to Harkins' academy, according to plans and specifications prepared by Harry Mott, architect, St. John, N.B.

Ottawa, Ont.
Weeks & Keefer, architects, have just taken tenders for the erection of new buildings at Rockliffe park for the directors of Ashbury College.

The Exhibition officials are considering a plan for converting the Howick pavilion into a Process building. G. W. Noffke, architect.

The congregation of Bell Street Methodist Church are contemplating the erection of a new building. It has not yet been decided whether to erect a new church and hall or only a Sunday school hall.

Palmerston, Ont.
Tenders addressed to A. P. Judge will be received until February 24th for all trades in the erection of a Catholic church to be constructed of brick, concrete basement. Plans and specifications may be seen at the Albion hotel, Palmerston, and at the office of the architect, Mr. George Gray, Harrisburg, Ont.

Renfrew, Ont.
It is proposed to build an addition to the Infirmary in this town at a cost of $25,000.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until February 26th for heating apparatus for the Renfrew public building. Plans and specifications may be seen at the office of John McNicol, Clerk of Works, Renfrew, and at the Department at Ottawa.

Stroud, Ont.
Tenders are being received for the proposed Presbyterian church. Plans and specifications with James Thompson, 43 Victoria street, Toronto.

Stratford, Ont.
It is stated that preparations are being made for converting the business block at the corner of Church and Ontario streets, recently occupied by Ney, Camp & Company, into a modern theatre.

Saskatoon, Sask.
Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until February 26th for the construction of post office, customs and inland revenue fittings at the public building. Plans and specifications may be seen on application to the caretaker, Mr. W. N. Powell, Saskatoon, or at the Department of Public Works, Ottawa.

Sydney, C.B.
The ratepayers will be asked to vote on a bylaw to raise nearly $142,000, $50,000 of which is for the new academy and $20,000 for public school extensions.

St. Marys, Ont.
The Public School Board are considering the erection of a new $40,000 school building.

St. John, N.B.
Separate tenders are being taken for the completion of the new Seamen's Institute. G. E. Fairweather, architect.

Additional accommodation is needed at the city hall and the City Council have two schemes under consideration, one for the remodelling of the present building by the construction of another storey, and the other for the purchase of a new building.

Trenton, Ont.
Tenders addressed to R. M. Foster, Chairman of Building Committee, will be received until March 20th for the construction of a public school in this town. Plans and specifications may be seen on application to Mr. Foster at Trenton and at the office of the architects, Ellis & Connery, Manning Chambers, Toronto.

Toronto, Ont.
In a report to the Board of Control, Park Commissioner Wilson estimates the cost of the necessary work for the restoration of the old fort at a total of $30,300.

The Board of Control have been petitioned to give the Upper Canada Tract Society a site at Bayside Park for the erection of a Sailors' Home. Mr. Potter told the Board that the estimated cost of the new building would be from $15,000 to $18,000.

Tenders addressed to Jos. Oliver, Chairman, Board of Control, will be received until February 23rd for the erection of a Transportation Building on the Exhibition Grounds. Plans and specifications may be seen at the office of G. Gouinlock, architect, Temple Building.

Victoria, B.C.

The Government will probably be asked to appoint an expert commission to select a site for the proposed British Columbia university.

Vancouver, B.C.

It is stated that a company is being organized for the erection of a large residential hotel to cost in the neighborhood of $200,000. Major Motherhill, of this city, is interested.

Tenders will shortly be taken by A. E. Blackmore, architect, for the construction of a combined bath house and promenade at a cost of $26,000. The building will be 264 feet long with an average width of 20 feet and will contain 154 dressing rooms. There will be eight shower baths and the construction will be of reinforced concrete, with the floors and walls of Adamite slabs.

Westville, N.S.

Tenders close February 22nd with N. Tessier, Secretary, Department of Public Works, Ottawa, for the construction of fittings at the post office at this place.

Winnipeg, Man.

The Collegiate Board have decided upon a site at the corner of William and Ellen streets for the location of a new collegiate institute.

At a recent meeting of the Board of Control, H. E. Penny, of Weston, told the members that a number of storekeepers in Weston were interested in a project for the erection of a gymnasium and swimming bath and asked if the city was prepared to make a grant. Controller Waugh announced that it was his intention to ask the legislative committee to submit a bylaw to provide money for this purpose.

The City Engineer is estimating the cost of a fireproof vault at the city yards.

Chief Buchanan is recommending the construction of a new fire station at Weston to replace the temporary structure there and advises that plans of the other suburban stations already erected be used for the purpose.

Residences

Peterborough, Ont.

Mrs. W. M. Graham will rebuild her summer resort, "Viamede," at Stoney Lake, recently damaged by fire.

Toronto, Ont.

Recent building permits include: A. Myers, 2 storey and attic brick dwelling, Warren road, $5,500; J. P. Kirby, brick dwelling, Concord avenue, $1,800; J. Lydiatt, 2 storey brick dwelling, Hogarth avenue, $4,000; T. W. Dutton, 2 storey and attic brick dwelling, Laxton avenue, $3,700; L. Mazza, 6 attached 2 storey and attic brick dwellings, Dufferin street, $14,000; J. Grandin, 1 pair semi-detached 2 storey and attic brick dwellings, Givens street, $5,000; E. Whitney, pair semi-detached 2 storey roughcast dwellings, brick fronts, St. Clarens avenue, $4,000; R. C. Vaughan, 1 pair semi-detached 2 storey and attic brick dwellings, Macpherson avenue, $5,700; H. H. LeDrew, pair semi-detached 2 storey brick dwellings, Westmoreland avenue, $4,000; Gratton Bros., 2 storey and attic brick dwelling, Clinton street, $3,600; John Drake, pair semi-detached 2 storey roughcast dwellings, brick fronts, Salem avenue, $3,000; Grandin and Deacon, pair semi-detached 2 storey brick stores and dwellings, College, street, $5,000; Chas. Fellows, 2 storey and attic brick dwelling, Spadina avenue, $2,800; A. J. McCarle, 2 storey and attic brick dwelling, Sunnyside avenue, $2,200; J. T. Hutson, 6 attached 2 storey brick dwellings, southwest corner Havelock and Sylvan, $18,000; P. Clayton, pair semi-detached 2 1-2 storey brick dwellings, near Bloor, on 735-737 Shaw street, $6,000; Thomas Flynn, 2 1-2 storey brick dwelling, Pembroke street, $4,900.

J. Francis Brown, architect, is taking tenders for additions and alterations to a large cottage on Centre Island.

Tenders for verandah, jacking, tuckpointing, and painting and paper hanging for two houses are being taken. Particulars may be obtained at 83 Bleecker street.

Victoria, B.C.

Parfit Bros. have obtained permits for the erection of two dwellings on Fernwood road to cost $2,400, and a dwelling on Vining street to cost $1,800.

Winnipeg, Man.

Recent building permits include; A. Galbraith, dwelling, Portage avenue and St. Paul, $2,000; H. Galbraith, dwelling, Bunell, $2,000; A. S. Walker, dwelling, Morley, $1,800.

West Toronto, Ont.

The following building permits have been issued: Johnston & Ridout, pair semi-detached, brick dwellings, Aziel street, $3,600; Jessie Hunt, solid brick house, Humberside avenue, $3,000; P. Peppiatt, brick dwelling, Willoughby avenue, $2,800; C. Follest, brick dwelling, May street, $2,600; J. E. Kerr, pair brick houses, Fairview, $3,600; W. A. Werry, brick dwelling, Annette street, $3,000; Maher & Fogg, semi-detached brick house, Durie street, $3,600.

Business Buildings and Industrial Plants

Brockville, Ont.

The buildings of W. M. and W. H. Brouse and E. R. Hardendorf were damaged by fire last week to the extent of about $3,000.

Chatham, Ont.

The drygoods store owned by H. W. Ball, and other buildings were damaged by fire last week at a total estimated loss of $75,000.

Calgary, Alta.

At the Western Movement of Grain Conference, recently held here, a resolution was passed asking the government to erect terminal elevators. The permanent committee appointed to carry into effect the resolutions passed, includes George Harcourt, Deputy Minister of Agriculture, E. J. Fream, Secretary of the United Farmers of Alberta, and L. P. Strong, Manager of the Alberta Pacific Elevator Company.

Estevan, Sask.

The Board of Trade are stated to be negotiating with an English firm wishing to manufacture tile, sewer pipe and other clay goods.

Goderich, Ont.

The grocery store owned by Cameron Moore was damaged by fire recently at a total estimated loss of $20,000.

Halifax, N.S.

The Halifax Fish Company's plant was destroyed by fire last week.

Kenora, Ont.

Nigrin & Company's dry goods store was damaged by fire last week at a total loss of $3,500.

London, Ont.

Tenders will be received until February 20th by Moore, Henry & Munro, architects, for alterations to the Ontario Loan & Debenture Company's building, corner of Market lane and Dundas street, comprising masonry, carpentry, ornamental terra cotta, tile, plastering, painting and glazing, structural and ornamental iron, light metal, sheet metal, plumbing, heating and electric wiring.

Montreal, Que.

The canning factory of J. W. Windsor was damaged by fire last week at an estimated loss of $20,000.

Melville, Sask.

The Massey Harris Company will shortly commence the erection of a distributing warehouse at this point.

It is stated that W. A. Snelgrove intends adding 20 rooms to his hotel early in March.

The G. T. P. will erect additional freight sheds here this spring. The new sheds will be 160 feet long. In addition, the company will install electrical generators to supply light and power in their building.

Port Stanley, Ont.

It is stated that a company is being organized for the erection of another large elevator here. Further announcements are expected shortly.

Peterborough, Ont.

Extensive improvements are being made at the Snowden house.

Port Arthur, Ont.

The machine shop of R. Williams was damaged by fire last week to the extent of $2,000.

Sydney Mines, N.S.

The Canadian Express Company will erect a new express office here.

Sarnia, Ont.

The Board of Trade have a proposition for the erection of a canning factory.

Swift Current, Sask.

S. A. Codd, manager of the Bank of Ottawa at Regina, was here recently looking at sites for the erection of a branch bank.

The C. P. R. will erect new freight sheds and a yard office within the next few months.

St. John, N.B.

Extensive additions will be made to the Royal hotel by Messrs. Raymond & Doherty.

St. Boniface, Man.

The City Council and the Union Stock Yards Company are stated to have practically come to an agreement in regard to the new stock yards. This agreement calls for the building by the city of a sewer from the corner of the stock yards' property to the Red river at a cost of $178,000, and the paving of Dawson and Marion streets. The company will erect yards at an expenditure yet to be determined, but approximately $350,000. A site will be

Tenders and For Sale Department

Tenders Wanted

Sealed tenders will be received by the undersigned up to NOON, MONDAY, MARCH 1ST, for General Hardware supplied as under:

Electrical, Rope, Twine and Chains, Paint, etc., Iron, Steel, etc., General Hardware, Tools, Lead Pipe and Brass, Miscellaneous, Grey Iron Castings, Bolts, Nuts, Washers, Nails and Screws, Brick and Clay, Gas Pipe and Fittings, Pump Packing, Hose and Rubber Goods, Horse Shoe Material, Coal and Coke, Oil, Waste, etc., Lamps and Lanterns

Specifications and bills of quantities can be had at the Office of the City Comptroller.

The lowest or any tender not necessarily accepted.

CITY COMMISSIONERS.

City Hall, Calgary, February 2nd, 1909. 8

Notice to Contractors

Tenders for Public School Building, Trenton, Ont.

Sealed tenders addressed to the undersigned and marked on envelope "Tender for School Building" will be received until 12 o'clock noon of the 20TH DAY OF MARCH, 1909, for the erection and construction, complete, of a Public School Building in the town of Trenton, Ont., in accordance with the plans and specifications prepared by the architect which may be seen at the office of Messrs. Ellis & Connery, Architects, Manning Chambers, Toronto, Ont., or with the undersigned at Trenton.

The lowest or any tender not necessarily accepted.

R. M. FOSTER,
Chairman of Building Committee

Dated at Trenton, Ont., 6th February, 1909. 7

City of Lethbridge, Alberta, Canada

Tenders for

Municipal Power Plant

Specifications, drawings and form of tender may be obtained from the Secretary-Treasurer, City of Lethbridge, Alberta, on and after the FIFTEENTH DAY OF JANUARY, 1909. The following are the sections issued:

A. Boilers and Accessories.
B. Economizer.
C. Feed Pumps.
D. Mechanical Draft.
E. Pipe Work and Valves.
F. Steam Turbine Generator.
G. Steam Engine Generator.
H. Re-erection of Steam Engine.
I. Condensing Sets.
J. Crane.
K. Switchboards, &c.
L. Motor Generators and Transformers.
M. Buildings, Steel Work, Etc.

Tenders on any or all of the above sections or any combination of the above sections will be received.

Tenders to be enclosed in a sealed envelope addressed "Tenders for Electric Plant" and to be delivered to the undersigned at the City Hall, Lethbridge, on or before the 1ST DAY OF MARCH, 1909, and to remain open for acceptance for two (2) calendar months from that date.

Each tender must be accompanied by a certified cheque payable to the Secretary-Treasurer, of the City of Lethbridge, for 10% (ten per cent.) of the amount of the tender, which will be returned to the tenderer, unless he fail to enter into contract for the work at the rate stated in the tender.

Plans and specifications may also be seen at the offices of Messrs. Smith, Kerry & Chace, Confederation Life Building, Toronto, Ontario, and the Carnegie Public Library Building, Winnipeg, Manitoba. The lowest or any tender not necessarily accepted.

A deposit of $10 (ten dollars) will be required for use of plans and specifications, which will be returned upon letting of contracts.

GEO. W. ROBINSON,
Secretary-Treasurer.

7

City of Calgary

Tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned, marked "Tender for Boiler and Generator," until the 18TH DAY OF FEBRUARY, NEXT, at 12 o'clock noon, for supplying to the City the following:

3 Water Tube Boilers equivalent to 1,000 H.P., with piping and induced draft system for 2,500 H.P.

Also 1 500 K.W. Generator connected to a 750 H.P. High Speed Engine for Railway System, with condensor, switchboard, etc.

A certified check on a chartered bank in Canada for 2½ per cent. of the amount must accompany each tender—Separate offers may be made for any of the items set out herein,

Plans and specifications can be had on application to the City Engineer, Calgary, Alta.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary, January 20th, 1909. 7

City of Brantford

Tenders for Cement, Sewer Pipe and Paving Brick

Sealed tenders addressed to John Moffat, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock noon on

Tuesday, February 23rd, 1909

for the above supplies required by the City of Brantford, during 1909.

Specifications may be seen, and instructions to bidders and forms of tender obtained on application to the City Engineer.

Each tender must be accompanied by a marked cheque payable to the order of the City Treasurer for the amount called for in the form of tender.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.

City Hall, Brantford, Feb. 8, 1909. 7

City of Calgary

Tenders will be received by the Commissioners of the City of Calgary and addressed to the undersigned marked "Tender for Street Railway Material," until the 18TH DAY OF FEBRUARY NEXT, 12 o'clock noon, for supplying to the City the following:

Covering approximately:
397 long tons No. 80 A. S. C. E. steel rails
746 " No. 60 " "
Together with certain special work, also spikes, bonds, tie plates.
Angle irons, track bolts, ties, etc.
12 standard street railway cars.
One street railway sprinkler.
" " " sweeper.

OVERHEAD CONSTRUCTION.

Steel span wire poles 30' and 35' three sections.
Cedar poles.
12.5 miles of 2.0 trolley wire.
10.2 miles of 3.0 feed wire.
Span wire.
Hangers, insulators, and conical strain insulators.
Ears.
Cross-overs and trolley frogs.

Bids will be received upon the entire schedule or any item of the same. A marked cheque covering 5 per cent up to $10,000 and 2½ per cent over and above this sum of the amount bid will be required to accompany each and every tender.

Full particulars and specifications will be supplied at the City Engineer's Office.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

Dated at Calgary January 20th, 1909. 7

Position Wanted

Architectural Draftsman seeks a position with an Architect. Experienced and understands construction well. Apply Box 139 CANADIAN CONTRACT RECORD, Toronto. 7

Board of Education

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board will be received until

Friday Noon, February 26th, 1909,

for

New School Building, Girls' Home

Enlargement of Fern Avenue School

Iron Stairs for Leslie, Morse and Perth Avenue Schools

Plans and specifications may be seen and all information obtained at the office of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in the said specifications and forms of tender.

The lowest or any tender will not necessarily be accepted.

W. HOUSTON,
Chairman of Committee

W. C. WILKINSON
Sec. Treas.

Builders and Contractors

Tenders for Transportation Building

Bulk tenders addressed to the undersigned will be received through registered post only, up to noon on

Tuesday, February 23rd, 1909

for the various works required in the erection and completion of a Transportation Building on the Exhibition Grounds, Toronto.

Plans and specifications may be seen, and all information, together with forms of tender, obtained at the office of Mr. George Gouinlock, Architect, Temple Building, Toronto.

Tenders must be accompanied by a marked cheque, payable to the order of the City Treasurer, or a cash deposit equal to 5 per cent. on tenders up to $1 000, and 2½ per cent. on tenders over that amount.

Should any party whose tender is accepted fail to execute the necessary contract and bond and give satisfactory security for the due fulfilment of the contract, the deposit accompanying the tender will be forfeited to the city.

A penalty sufficient to insure the full completion of the work on or before the 21st day of August, 1909, will be exacted.

The lowest or any tender not necessarily accepted. The deposits of unsuccessful tenderers will be returned.

JOSEPH OLIVER, (Mayor)
Chairman, Board of Control

City Hall, Toronto, Feb. 13th, 1909.

Canadian Agents Wanted

A British firm manufacturing Tiles, Mosaics, Faience, Terra Cotta, etc., wants Canadian agents in Toronto, Winnipeg, Montreal and other large cities. Correspondence confidential Box 140 CONTRACT RECORD, Toronto. 12

TENDER

Tenders will be received up to noon, MARCH 1ST, 1909, by the City Commissioners addressed to the undersigned for the supply of material and labor necessary for the construction of a

Coal and Ash Conveyor

for the City of Calgary.

Plans and specifications can be obtained at the City Engineer's Office.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk. 8

Business Buildings and Industrial Plants

(Continued from page 21)

provided by the company for the erection of a municipal abattoir.

Toronto, Ont.
The Canada Cycle & Motor Company will erect a 4-storey building on Richmond street at a cost of about $50,000.

Grandin & Deacon will erect a pair of semi-detached two-storey brick stores and dwellings on College street at a cost of $5,000.

A permit has been granted to P. Burns for the erection of a one-storey galvanized iron coal shed on Princess street and Esplanade, at a cost of $10,000.

R. L. Smith has obtained a permit to build four attached two-storey brick stores and dwellings on Queen street west at a cost of $8,000.

W. S. Walker will build a three-storey brick store and dwelling on Pembroke street at a cost of $4,900.

Robins, Limited, report the sale of the property of Mr. A. Patterson, Nos. 291, 293 and 295 Yonge street, to a purchaser for the erection of a business block to cost $70,000.

S. R. Willinsky has secured an option on his property at the northwest corner of Yonge and Edward streets with a view to the erection of a large store and office building.

Vancouver, B.C.
Plans are being prepared for the erection of a reinforced concrete block on Granville street for Mr. Bower. The building will have a frontage of 50 feet and will be six storeys high.

J. E. Hall, manager of the Vancouver Milling and Grain Company, states that his company is considering the erection of a 500,000 bushel elevator on Burrard Inlet. If the project is carried out the cost will be in the neighborhood of $400,000.

Welland, Ont.
The Town Council is stated to be negotiating with the Kee Lox Company, Rochester, N. Y., manufacturers of carbon paper and typewriter ribbons, for the establishment of a Canadian branch factory.

Winnipeg, Man.
Construction of the twelve-storey block to be erected by the G. T. P. at the corner of Portage avenue and Main street, will be commenced next month. J. H. Russell is preparing plans.

Improvements to the Winnipeg shops are planned by the Canadian Northern, and on the arrival of spring, work will commence on several additions to the works at Fort Rouge. A carpenter shop, costing $25,000, will be erected and smaller additions to the present buildings will also be made.

Darling & Pearson, architects, will prepare plans for the erection of a new building for the Canadian Bank of Commerce at Fort Rouge, on a site recently acquired at the corner of Osborne street and Stradbrooke place.

The Manitoba Iron Works have purchased a considerable amount of property on Logan avenue, where they will make extensive additions to their plant.

Tenders addressed to W. W. Blair, architect, will be received until February 27th for the erection of a 5 storey and basement brick, stone and fireproof apartment block on the northeast corner of Roslyn road and Osborne street, for Dr. R. I. Mattice.

Tenders are invited by W. W. Blair, architect, until February 27th for all trades in the erection of a 6 storey and basement brick building, 50 x 120 feet, on Main street south.

Waterloo, Ont.
The Mutual Life Assurance Company, of Waterloo, have decided upon the erection of new head offices in this town. Plans will be prepared and contracts let at once.

AWARDED.

Saskatoon, Sask.
Samuel Brown, of Winnipeg, has been awarded the contract for the erection of the new freight sheds for the C. N. R. Approximate cost, $20,000.

Woodstock, Ont.
Tenders for the erection of the Oxford Knitting Company's new building were opened last week, W. J. Taylor being the successful tenderer at $18,930. The tenders were as follows: T. D. Broom & Son, $22,125; John McIlwraith, $18,963; F. Book, $19,840; P. H. Secord & Sons, $19,408; John Tindall & Son, $21,500; W. J. Bond, $20,250; Whitehead & Johnston, $21,030; Thos. Edmonds, $19,696; Jos. Campbell, $19,696; James Coulter, $19,975; W. J. Taylor, $18,930.

Power Plants, Electricity and Telephones

Belhaven, Ont.
Permission has been given to Dr. Greenwood, of Sutton, Ont., to construct a telephone line from Sutton to Ravenshoe.

Campbellford, Ont.
The Seymour Power & Electric Company are placing contracts for the construction of a power house at Campbellford which will develop 4,000 horse-power; contracts for the important machinery have already been made with the Canadian Westinghouse Manufacturing Company, the Canadian General Electric Company, Wm. Kennedy & Sons and the General Electric Company, of Sweden. Engineers, Smith, Kerry & Chace, Toronto.

Dawson, Yukon.
The owners of the Sourdough Mine, 40 miles from this city, propose to buy the local plant and supply light, power and telephones to the whole district.

Edmonton, Alta.
The City Council has decided to build an additional 5 miles of track at once on the line of the Edmonton Radial Railway. R. R. Keely is general manager.

Galt, Ont.
Representatives of Mr. John Patterson, the promoter of the Hamilton-Guelph electric road, were recently in this town purchasing the right of way for the new railway which it is proposed to construct this spring.

Hamilton, Ont.
Mayor McLaren has received from Engineer Sotham answers to the questions submitted to him regarding the cost of Hydro-Electric power to Hamilton. Mr. Sotham says the commission will be able to furnish power to this city at $17.52, or two cents per horse-power more than the original estimate, while this city's share of the cost of the transmission line, etc., will be only $73,000, a much lower figure than was at first estimated.

Kamloops, B.C.
H. K. Dutcher, of Cleveland, and A. Dutcher, Vancouver, B.C., have been engaged by the city to make a report on a scheme for reorganizing the municipal electric lighting and pumping plant.

London, Ont.
Application is now being made for the incorporation of the London and North Western Railway Company for the construction of an electric line from this city to Sarnia, and from London to a point on Lake Huron, in the county of Huron.

Port Colborne, Ont.
The Niagara Peninsular Railway Company will apply for permission to build a branch line of electric railway from this place through Welland, Ont.

Peterborough, Ont.
Announcement is made that the Peterborough Radial Railway Company contemplates extending its line from Clear Lake to a point in Stony Lake in Peterborough County. J. H. Larmouth is general manager.

Portage la Prairie, Man.
At a recent meeting of the City Council, Mr. E. A. McPherson on behalf of Carton, Addington & Miles, asked for a franchise for a power and lighting system. Aldermen Prout, Garland and Cooper were appointed a committee to investigate the proposition.

St. Marys, Ont.
It is stated that final surveys of the North Midland Electric Railway are now being made and that the system will be in operation in a few months.

Swift Current, Sask.
A by-law granting a franchise to F. Laidley for the installation of an electric light and gas plant has received its second reading.

St. Johns, Nfd.
R. W. Strong and E. W. Roberts, promoters of the Newfoundland General Electric Company, are soliciting signatures to a petition to the Newfoundland Legislature asking for a charter, under which a company is to be formed to light Bonavista, Catalina, King's Cove and Trinity by electricity—the power to be derived from Trinity Pond and Catalina Brook. Numerous signatures were obtained to the petitions, and the promoters are confident of success, if the requisite charter can be obtained. American capitalists are prepared to put up all the money necessary to carry on the work. In addition to electric lighting the company propose operating an electric trolley line between Catalina and

Bonavista; the building of a marine slip, either at Catalina or Trinity, and the supplying of electric power to such local factories as the company may establish.

Toronto, Ont.

The People's Railway Company have not yet awarded any contracts for the construction of the proposed overhead electric railway yhich is to connect Stratford, Berlin, Guelph and Woodstock, by way of Hamburg, Berlin, Fergus and Elora. The system will have about 18 miles of single track. It is the intention of the company to begin construction in April. Power will be purchased from the Hydro-Electric Company. The repair shops will probably be located at New Hamburg. The company has applied for a charter. Capital, $1,000,000. Headquarters, 428 Traders' Bank Building, Toronto, Ont. Directors: N. R. Bugg, Bright, Ont.; W. A. Bugg, Joseph McNeil, A. N. Warfield and J. H. Wood, Toronto.

Winnipeg, Man.

Tenders for electric wiring and fittings for the new examining warehouse will be received until March 2nd by N. Tessier, Secretary, Department of Public Works, Ottawa.

Bids will be received at the office of the Chairman, Board of Control, until March 2 for supply and delivery of insulators, telephone line, transmission line and repair shop equipment in connection with the proposed Point du Bois hydro-electric development. Engineers, Smith, Kerry & Chace, Confederation Life Building, Toronto, Ont. M. Peterson, Secretary, Board of Control.

AWARDED.

Chemainus, B.C.

Hinton & Company, Victoria, B.C., have been awarded the contract for the installation of a new electric plant at the Palmer mills. This company have recently completed contracts for a fire alarm system and a lighting plant at Vernon, B.C.

Edmonton, Alta.

Tenders were recently opened for the new machinery required for the power house extension. Following are the bids on two 400 kw. generators: Canadian General Electric, weight, two machines, 45,000 pounds, $8,500; Northern Electric Company, 50,000 ponuds, $9,250; Allis-Chambers-Bullock, 57,000 pounds, $10,250; Canadian Westinghouse Company, 56,000 pounds, $9,800; Crocker-Wheeler Company, 42,000 pounds, $7,100. All of these machines were quoted f.o.b. Edmonton, freight and duty paid, except the Westinghouse, which was f.o.b. Hamilton. The Crocker-Wheeler tender was accepted.

Winnipeg, Man.

The tender of G. A. Powell, Winnipeg, has been accepted for supplying 8,000 lbs. of copper and six miles of iron wire for fire alarms and street railway lighting extension, the copper wire at $17.85 per 100 pounds, and the iron wire at $41.45 per mile.

Miscellaneous

Calgary, Alta.

F. P. Alwin, C.E., Ottawa, Ont., is shortly to commence a large irrigation scheme near Calgary. The scheme affects nearly seventy thousand acres, and water is to be diverted from the Daw river. The estimated cost is $500,000.

Fort William, Ont.

Tenders for ties, cull ties and cedar poles will be received until February 19th by H. S. Hancock, City Engineer, to be as follows: 5,280 railway ties, 8 feet by 8 inches by 6 inches, minimum face 6 inches; 11,840 No. 1 cull ties, minimum face, 4 inches; 290 cedar poles, 35 feet, sound and straight, not less than 6 inches. Full particulars may be obtained on application.

Ottawa, Ont.

The Department of Public Works will receive tenders until February 23 for two 60 cubic yards centre hopper wooden dumping scows.

Tenders will be received by W. W. Cory, Deputy Minister of the Interior, until February 22nd for 144 cedar posts and 113,000 feet best quality spruce timber of various dimensions up to 6 in. x 6in. and 27 feet long, to be supplied not later than April 8th, 1909.

Winnipeg, Man.

Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until February 22nd for supply of from 500 to 1,000 cords of cedar for block paving.

Tenders for the supply of 660 feet of 20 inch 5-ply rubber belting for gravel conveyor will be received until February 22nd by M. Peterson, Secretary, Board of Control.

AWARDED.

Portage la Prairie, Man.

The contracts for improvements to Crescent Lake have been awarded as follows: For erection of needle dam and bulkhead on Assiniboine river, William Carr, Portage la Prairie, $14,000; for canal and earth dam, between Assiniboine river and Crescent Lake, C. P. Wright, Portage la Prairie, 15 cents per cubic yard; approximate total $4,000. For steel and iron work for needle dam, Manitoba Iron Works Company, Winnipeg, $534.

NOTES.

George Taylor, plumber and decorator, Preston, Ont., has assigned; creditors met February 15th.

David M. and David S. Hiltz, New Ross, N.S., have gone into partnership as lumber manufacturers.

The plant of the Stark Telephone, Light & Power System, Limited, is advertised for sale by tender on the 4th March.

The annual general meeting of the Roman Stone Company, Limited, will be held at the residence of Sir Henry Pellatt, 559 Sherbourne street, Toronto, on Saturday, February 20th, at 8.15 p.m.

Good progress is being made on the Detroit river tunnel. The open cut on approach to tunnel on the Canadian side is completed, together with the retaining walls at the lower end. 1,780 feet Canadian approach tunnel completed with the exception of wiring and tracks, with an additional 595 feet of centre wall completed and 755 feet partly completed. Subaqueous portion—7 sections of tubes making length of 1,813 feet sunk and concrete placed around same. Five of the tubes have been pumped out and preparations are now being made for the construction of inner ring of concrete. Connection between Detroit end of tubes and Detroit approach tunnel is partly completed; some 1,635 feet of approach tunnel on Detroit side completed with the exception of wiring and tracks, as also an additional length of 185 feet of centre wall. The open cut approaching tunnel on Detroit side is completed, together with retaining walls. The work is 12,800 feet long, sub-divided as follows: Westerly open cut, 1,510 1-2 feet; westerly approach tunnel, 2,164 1-2 feet; subaqueous portion, 2,625 feet; easterly approach tunnel, 3,600 feet; open cut, 2,900 feet. The work will probably be entirely completed by the beginning of 1910.

From Ottawa is announced an important reorganization of the Railway Commission by which the Dominion is divided into districts, each in special charge of one of the commissioners as to routine applications. Chief Commissioner Mabee will, of course, have a general supervision over each district. The Province of Ontario, with the exception of Port Arthur and the district west thereof, is placed under the immediate jurisdiction of Mr. D'Arcy Scott, the Assistant Chief Commissioner, and he will be assisted by Inspectors James Ogilvie and James Clarke. The Provinces of Quebec, New Brunswick, Prince Edward Island and Nova Scotia are allotted to Hon. M. E. Bernier, who will be assisted by Mr. E. C. Lalonde, inspector. Commissioner S. J. McLean takes charge of Manitoba, Saskatchewan, and that portion of Ontario west of Port Arthur, with Mr. W. S. Blythe, of Winnipeg, as inspector. Alberta and British Columbia will be looked after by Commissioner Mills, assisted by Inspector M. J. McCaul.

Michael A. Piggott, of Hamilton; Hubert E. Larkin, and Alexander Sangster, of St. Catherines, trading as M. A. Piggott & Company, contractors, are suing the Guelph & Goderich Railway Company, claiming $523,574.75 and interest, for work done, materials supplied, and expense incurred pursuant to contract, and they claim damages for breach of contract. Plaintiffs claim that extra work and extra haul were ordered by defendants in excess of what was originally agreed upon. Work was completed August 20th, 1907, and accepted by defendants, being approved by their Chief Engineer, P. A. Peterson. The original claim was for $1,117,115.66 and interest, on which defendants have paid $593,540.91, repudiating liability for balance, except for less than $100,000 not yet paid, and which they have refused to pay except on condition that plaintiffs accept it in full of all claims. Defendant company relies upon provisions of contract, and says plaintiff did not construct work within time limited thereby, and that they have not yet completed it; also, that all progress certificates issued by the chief engineer have been fully paid, and that final certificate has not yet been given. They deny the claim of extras, and counter-claim for loss and damage by alleged failure to complete work according to contract for $250,000.

The estimates submitted by City Engineer Rust of Toronto total $1,247,812 as compared with an expenditure of $490,028 in 1908, but as usual Mr. Rust has included some large items which the Council will not see their way clear to undertake. Among the chief items for which there was no expenditure last year, and which help swell the total, are the following: Princess street yard, $5,000; concrete mixers, $2,500; new dredge, $80,000; new tug, $10,000; Winchester street bridge, $15,000; Dundas street bridges, widening, $47,000; three new public lavatories, $15,000; maintenance of same, $2,000; Dundas bridges repairs, $7,000; Island waterworks, $6,000; Island walks, $5,000; sidewalks, $10,000; detection of waste, $20,000; electrical pump, high level, $60,000; high pressure pump, main pumping station, $150,000; extension John street waterworks docks, $30,900; mains for supply of East Toronto and high level east of Don, $153,000; pipe cutting machine, press house, $575; high pressure fire service, $6,000.

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A Good Time to Stir Up New Business

The only satisfactory way to get business is to go after it. This applies as forcibly to the building trade as to any other line of activity, and if ever there was a time when business should be gone after, it is to-day. Never were conditions more of a nature to point to the wisdom of a policy of going in search for new business. The dull times are over and a breathing spell has been afforded, before activity is renewed. The year 1908 had more than its share of dulness but the year 1909 promises to make up in a large measure for the shortcomings of its predecessor, and the man who stirs himself to- day will probably find himself so busy when the spring comes that he will be unable to take on more business.

The signs of the times all point to a season of great activity, but this does not mean that every one will get his share of the new business. The most effective manner to get business is to let people know about your work. If demand is small, one may do something in the way of creating demand by seeking out those who may be expected to build. A personal visit and a sound argument or two should go a long way with conditions as they are at present. The available arguments are exceptionally strong just now. Money is cheap. Labor is cheap, compared to what it will probably be before the end of 1909, and laborers are more inclined to be reasonable than during periods of great business expansion. Materials are cheap. An early spring is promised in most sections of Canada and building will be possible sooner than in other years. The hard times are over and with cheap money people will probably soon learn to invest it. Those who want homes will be better able to afford them. Those who wish to erect buildings on speculation will have less risk to assume.

A few arguments of this sort and a judicious policy of publicity on the part of the builder or contractor should go a long way towards making the coming season compensate for the deficiencies of the one which has just passed. There really should be no such thing as a dull season for a progressive builder. When business slackens a little he should cast about for a chance to stir up a new demand. There is a great amount of new business about to come out now, and the opportunities of the present are greater than they have been at this season, for some years past.

Bankers are Anxious to Lend Money

"Money is so easy now," says a Montreal paper. "that bankers are beginning to protest when brokers pay off their loans.

"The other day a broker paid off a large loan with a bank, and the banker called him up over the 'phone:

" 'Why are you paying as off?' asked the banker.

" 'Because I don't need the money,' replied the broker.

" 'Well, keep your money and pay off somebody else,' said the banker."

Familiarity with Contract Law Essential

The many differences which arise concerning the terms of building contracts are evidence alike of the proneness of engineers, architects and contractors to misconstrue apparently simple points, and of the fallibility of the specification writer. The latter is the lesser consideration, for, with all the technicalities of the law, the verdict of our courts is generally based upon experience and the principles of common sense rather than upon the chances for evasion and non-fulfilment which are sometimes provided in the actually literal meaning of the text of the contract. Not that the specification is a minor matter—in its particular import to the building fraternity few considerations are greater—but generally the fundamental understanding of equity, which governs, or should govern all transactions, occupies, and rightly so, the first place.

Engineers, architects and contractors, like the rest of the community, have yet much to learn. Those of the greatest discernment will be the first to admit this and seek to improve themselves by studying the mistakes of others. In a case which recently came to light an engineer in the employ of a city was appointed to act as arbitrator under a contract for the construction of waterworks, to which the city and a contractor were parties. The engineer was empowered to direct the contractor to do extra work with the approval of the City Council and to decide all questions which should arise relative to the installation of the waterworks by the contractor. After the works had been substantially completed to the satisfaction of the engineer, and had been in the use of the city for three months, a break and leak occurred in the settling basin which rendered them unfit for use. Thereupon, by direction of a committee of the City Council, the engineer notified the contractor to repair the basins and to make them water tight, or that the city would do so at his expense. The contractor replied that he was not responsible for the break and refused to remedy it. In an action by the city against the contractor it was shown that the engineer had given his final certificate as to the proper completion of the work and had determined that the percentage which was to be retained until the work was finished, was due and payable to the contractor. It was held, accordingly, that the authority of the engineer to act as arbitrator had ceased and that his mere direction that the contractor repair the break did not make such work a legal obligation upon the contractor.

Another instance of ignorance of the law is provided by a case in which the parties had entered into a contract for the erection of a hotel and bank building. Final payment was to be made upon the certificate of the architects within ten days after completion of the work. The owners refused to pay the contractor on the ground that he had not presented the architect's certificate that the work had been done to their satisfaction, as required by the contract. The contractor showed that the architects were employed by the owner and refused to go to the job, which was at a distance, for the purpose of inspecting the work, unless so directed by the owner, and as the owner would not give such directions, the architects did not see the building and could not issue their certificate. The evidence was held to justify an inference that there was collusion between the owner and his architects which obviated the necessity of obtaining a certificate.

These examples prove how easily a comparatively simple point may be misinterpreted and show the necessity for every engineer, architect and contractor to make himself familiar not only with the letter of the law, but with its general purport.

Obituary

With the death of Mr J. G. McGrath, C.E., which occurred last month, there passed away one of the good old-time engineers who carried out many important works in the last generation. Mr. McGrath was one of the engineers in charge of the construction of the Victoria Bridge, Montreal. He was born in England and returned there after over thirty years spent in Canada. Mr. McGrath was also connected with the work upon the Intercolonial & Northern Railway, being associated with Messrs. Peto & Brassey in this work, as well as other important undertakings in this country. In 1861, at the time of the Trent affair, Mr. McGrath and others raised an engineer corps, which later became the present Royal Grenadiers. He also volunteered for service with the Queen's Own Rifles of Toronto in the Fenian Raid, and was at the time of his death a member of the Toronto Veterans' Association of 1866. In the Crimean War times he held a commission in the army and saw active service around Sebastopol. On returning to England in 1855 he was engaged on the construction of the Manchester ship canal, and later on the Buenos Ayres docks. He retired from active life about ten years ago.

Mr. Maurice Perrault, A.I.C., Montreal, died last week at his home, Longueuil, after a lingering illness. Death resulted from cancer of the throat. Mr. Perrault had been in poor health ever since the last provincial elections, in which he took an active part.

Mr. Perrault was a charter member of the Architectural Institute of Canada and had been one of its vice-presidents since its formation. He was 51 years of age and was the son of Henri Maurice Perrault, whom he succeeded in business in 1877. Since then he had devoted himself largely to his profession. His work consisted mostly of planning churches, convents and other large structures. From 1888 to 1892 he was official architect for the district of Montreal under the Hon. P. Garneau, then Minister of Public Works. From 1889 to 1895 he acted as expropriation commissioner for the city of Montreal. He was one of the organizers and members of the Architects' Association of the Province of Quebec, had been a member of the American Public Health Association since 1894, and a member of the Civil Engineers' Society of Canada since 1898. He represented Chambly in the Quebec House of Assembly since 1900, when he was elected by acclamation, but at the two following general elections he was unsuccessfully opposed. He was also mayor of Longueuil for several years.

Mr. Perrault was possessed of a pleasing presence, was a fine platform speaker and a debater of recognized ability in the House, where he was always accorded respect and attention when he rose to speak. For some years past he was recognized as a debater of marked ability with respect to the financial affairs of the province. He was chairman of the Private Bills Committee of the Legislature during the last session. Mr. Perrault's death will prove a severe loss to the architectural and engineering professions.

The late Mr. Maurice Perrault.

Personal

It is reported that a new city engineer will be appointed by Hamilton, Ont. Among those mentioned for the position are Messrs. A. F. McCallum, Toronto, and J. W. Tyrrell. It is proposed to give Mr. Barrow, the present engineer, a retiring allowance and retain him as consulting engineer.

Mr. J. T. Child, formerly consulting engineer, Calgary, Alta., has been appointed city engineer of that municipality.

Mr. Roland Yeates, of the London Machine Tool Company, and Mr. Rudel, formerly of the Canadian Fairbanks Company, Limited, have formed a partnership.

Mr. R. A. Norman, M.P.P., has resigned his position as Town Clerk of Picton, Ont. Mr. Norman was made town clerk on Sept. 1st, 1893, and his predecessor, the late Mr. John Twigg, held the office for 37 years.

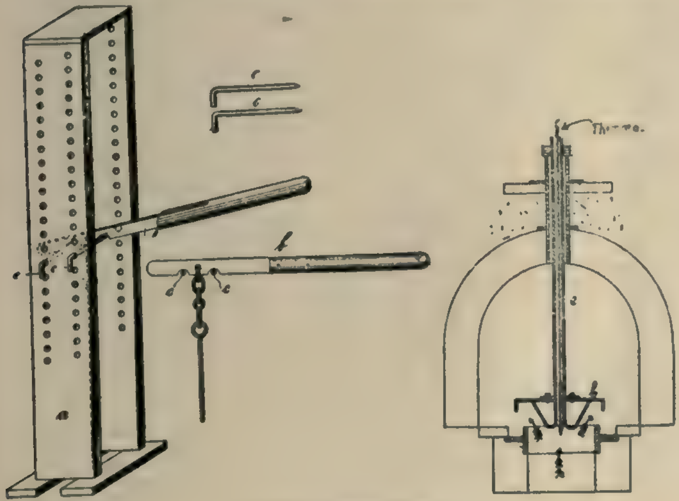
To cement manufacturers and supply men: Do not let your customers be ignorant as to the best way to work the cement you supply. If they fail to get good results they will blame the cement, not themselves.

Two Useful Kiln Accessories

Amongst some of the smaller difficulties met with in working a continuous kiln is the difficulty of actually raising some of the dampers to precisely the required height, and the simple gauge shown in fig. 1 may be useful in this respect. As described by a writer in a German contemporary, it consists of a pair of strong wooden uprights, joined at top and bottom by cross pieces, the uprights (fig. 1) being perforated with two rows of holes arranged about 2 inches apart. The holes themselves should be about ⅜-inch diameter, and should not be level to each other, but the right-hand vertical row should be a little higher than that on the left. This enables the adjustment to be made more accurately than when both sets of holes are on the same level. A level (b) connected to the damper by a rod or chain, as shown, and two strong pine (cc) are also needed.

The lever is preferable to the use of a single pin passed through a loop in the rod attached to the damper, as the majority of dampers require the exertion of a considerable force to lift them, and this is reduced when a lever is used, as shown. By raising the pins alternately, and using them as the fulcrum of the lever, the tightest damper may readily be raised to any desired height.

By marking the holes with numbers or other signs, the burner can ensure the damper always being open to a regular height, whilst by the use of the two pins at different levels the differences in heights of the damper can be regulated with much greater accuracy than is possible with the ordinary form of upright with a single row of holes.



Kiln Accessories.

It is often desirable to determine the temperature of the gases passing through various flues in a continuous kiln, but without opening the dampers in order to insert the thermometer. Hitherto this has been difficult, and the disadvantages accompanying the lifting of the bell dampers have been so great as to prevent the temperature records being sufficiently accurate to be of any practical use except in a few isolated instances.

The arrangement shown in fig. 2 enables this difficulty to be overcome, and, by permitting temperature measurements to be made in closed flues formerly inaccessible, gives the burner a simple means of regulating his firing, and of detecting the presence of air which has leaked in through defects in the walls or flues of the kiln.

The construction of the bell damper is so simple as to need no detailed description, as the chief difference between it and the ordinary bell consists in the substitution of an iron pipe (e) in place of the usual rod, the damper bell being bored so as to admit of the insertion of a thermometer through it from above by means of a small, light chain, as shown.

As will be seen from the illustration, the smaller lower part of the flue or the larger upper portion can be tested for temperature without in any way affecting the position of the damper or disturbing the movement of the flue gases or air currents in the kiln. Such an arrangement is, therefore, invaluable in the steaming or smoking of the goods, as well as at later stages in the firing, by enabling the burner to ascertain at any time the exact temperature of the gases used in any part of the kiln. This also enables the fireman to see what proportion of heat is being lost at different stages of the firing, and to reduce these losses to a minimum.

The apparatus is so simple that it can be made at a trifling cost by anyone used to working in metals, for, though patented in Germany, its use in this country is free from all restrictions.

Simple appliances, such as the two just described, when used with discretion by burners who are really interested in their work, are of great value, as they not only make the firing easier because it is more under control, but they increase the effective skill of the burner himself by giving him a greater insight as to what is going on inside the kiln, and enabling him to regulate the draught and other important factors in the burning with more than ordinary accuracy. On this account they are worth the attention of every man engaged in the construction or firing of continuous kilns.

Plans of the Hydro-Electric Commission

With the commencement of the actual work of construction of the Hydro-Electric transmission line near at hand, arrangements are now being made for the enlargement of the staff of the commission, which will look after the work. The commission, of course, will be the head, with the chief engineer. About forty engineers and their assistants will be apointed, and the work will be divided into the four branches of accounting, operating, construction and engineering. Engineers will be in charge of the transmission line construction, transformer stations construction, right-of-way and design. There will also be shop inspectors, foremen and assistants.

Dundas will be the operating station, and the power will be sent to the various lines from there. It will also be the transforming station for Hamilton and Dundas. This will be the most important station on the line.

The offices occupied by the commission in the Continental Life Building, Toronto, have been enlarged to accommodate the increased staff, and will be occupied until more commodious quarters are provided in the new addition which will be built to the Parliament Buildings.

The following officers have been elected for the Union of Alberta Municipalities for the present year: Hon. President, Ex-Mayor Cousins, of Medicine Hat; President, Ev-Mayor W. A. Griesbach, Edmonton; -st Vice-President, Mayor R. R. Jamieson, Calgary; 2nd Vice-President, Ex-Mayor H. H. Gaetz, Red Deer; Secretary-Treasurer, John T. Hall, Medicine Hat; Executive Committee, W. Laurie, Cordston; F. C. Jamieson, Strathcona; Mayor D. Milne, Medicine Hat; D. Grier, Macleod; Ex-Mayor E. Michener, Red Deer; Mayor M. A. Brimacombe, Vermilion.

Some cement workers say there is no room for a small cement plant. There is ample opportunity in several districts, if you know where to go.

Interesting Report on Portland Cement

Standard Method of Testing and Specifications Submitted to the Canadian Society of Civil Engineers

At the recent convention of the Canadian Society of Civil Engineers, held at Toronto, the following report of the special committee upon the standard method of testing, and specifications for Portland cement, was received by the council, who will submit it to members individually before adoption at the next annual meeting:

Portland Cement.

Definition.—This term is applied to a hydraulic connecting material manufactured from approximately 1.7 parts of lime by weight, to 1 part of soluble silica alumina iron oxide, finely ground, intimately mixed, calcined to incipient fusion, and again finely ground. To this product not more than 3 per cent. of other material shall be added fo rparticular purposes.

Weight.—Unpacked Portland Cement weighs approximately 84 pounds per cubic foot, and when hard packed, approximately 116 pounds per cubic foot. One hundred pounds of cement should be considered as one cubic foot, as a basis of measurement for mixing mortar and concrete.

Inspection.—All cement shall be inspected, and at least 12 days shall be allowed for testing and inspection of the cement before it is used in the work.

Testing.—All tests should be made in accordance with the standard methods hereinafter detailed, and should be made by an experienced person, having proper means for making the tests. Where field tests give results which leave reasonable doubt as to the quality of the cement, it is recommended that samples be submitted for laboratory check tests, to an experienced tester of recognized ability and standing, before final acceptance or rejection under these specifications. Cement failing to meet the seven-day requirements may be held awaiting results of the 28-day tests.

Storage.—On all work where so demanded by the engineer, the contractor or other person in charge of the work, shall provide a suitable weather-tight building for the storage of cement, and the cement shall be stored in such a manner as to allow easy access for sampling and identification of each shipment.

Packages.—All cement shall be delivered in cement-tight packages, with the name of the manufacturers, the brand, and the net weight, plainly marked thereon.

Sampling.

Selection of Sample.—The selection of the sample for testing is a detail that must be left to the discretion of the engineer. The number and the quantity to be taken from each package will depend largely upon the importance of the work, the number of tests to be made, and the facilities for making them. The sample shall be a fair average of the contents of the package; it is recommended that, where conditions permit, one package in every 25 be sampled. Samples should be passed through a sieve having 20 meshes per lineal inch, in order to break up lumps and remove foreign material. This is also a very effective method for mixing them together in order to obtain an average. For determining the characteristics of a shipment of cement, the individual samples may be mixed and the average tested. Where time will permit, however, it is recommended that they be tested separately.

Chemical Analysis.

Requirement.—The cement shall contain not more than 4 per cent. of magnesia (MgO), nor more than 2 per cent. of anhydrous sulphuric acid (SO2).

Significance.—Chemical analysis may render valuable service in the detection of adulteration of cement with considerable amounts of inert material, such as ground limestone. It is of use also in determining whether certain constituents, believed to be harmful when in excess of a certain percentage, as magnesia, and sulphuric anhydrid, are present in inadmissible proportions.

The determination of the principal constituents of cement (silica, alumina, iron oxide and lime) is not conclusive as an identification of quality. Faulty character of cement results more frequently from imperfect penetration of the raw material or defective burning than from incorrect proportions of the constituents. Cement made from very finely ground material, and thoroughly burned, may contain much more lime than the amount usually present, and still be perfectly sound. On the other hand, cements low in lime, may, on account of careless preparation of the raw material, be of dangerous character. Further, the ash of the fuel used in burning may so greatly modify the composition of the product as largely to destroy the significance of the results of analysis.

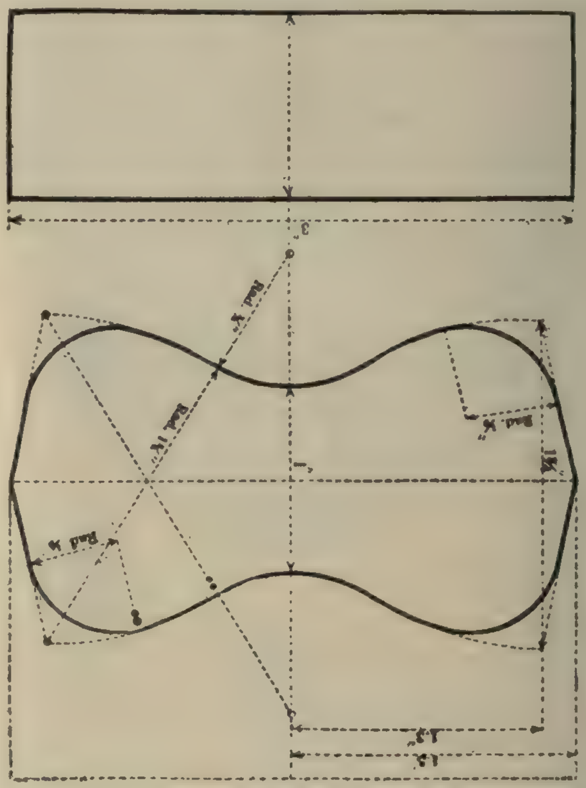


Fig. 1.

Method.—The method to be followed for the analysis of cement shall be in accordance with that proposed by the Committee on Uniformity in Analysis of Materials for the Portland Cement Industry, of the New York section of the Society for Chemical Industry.

Specific Gravity.

Requirement.—The specific gravity of the cement, ignited at a low red heat, shall not be less than 3.10, and shall not show a loss on ignition of over 4 per cent.

Significance.—The specific gravity of cement is lowered by underburning, adulteration and hydration,, but the adulteration must be in considerable quantity to affect the results appreciably. Inasmuch as the differences in specific gravity are usually very small, great care must be exercised in making the determination.

Apparatus and Method.—The determination of specific gravity is most conveniently made with Le Chatelier's apparatus. This consists of a flask of 120 cu. cm. (7.32 cu. inches) capacity, the neck of which is about 20 cm. (7.87 inches) long. In the middle of this neck is a bulb, and above and below the bulb are two marks, the volume between which is 20 cu. cm. (1.22 cu inches). The neck has a diameter of about 9 mm. (0.35 inches), and is graduated into tenths of cubic centimetres above the upper mark. Benzine (62 degrees Baume Naphtha), or kerosene free from water should be used in making the determination.

The specific gravity can be determined in two ways.

The flask is filled with either of these liquids to the lower mark, and 64 gr. (2.25 ounces) of powder, cooled to the temperature of the liquid, is gradually introduced through the funnel (the stem of which extends into the flask at the top of the bulb) until the upper mark is reached. The difference in weight between the cement remaining and the original quantity (64 gr.) is the weight which has displaced 20 cu. cm.

The whole quantity of the powder is introduced, and the level of the liquid rises to some division of the graduated neck. This reading, plus 20 cu. cm., is the volume displaced by 64 gr. of the powder. The specific gravity is then obtained from the formula: Specific gravity equals the weight of the cement in grammes divided by the displaced volume in cu. cm.

The flask, during the operation, is kept immersed in water in a jar, in order to avoid variations in the temperature of the liquid. The results should agree within 0.01. The determination of specific gravity should be made on the cement as received, and should it fall below 3.10, a second determination should be made on the sample, ignited at a low red heat.

A convenient method for cleaning the apparatus is as follows: The flask is inverted over a large vessel, preferably a glass jar, and shaken vertically until the liquid starts to flow freely. It is then held still in a vertical position until empty; the remaining traces of cement can be removed in a similar manner by pouring into the flask a small quantity of clean liquid and repeating the operation. More accurate determination may be made with the picnometer.

Fineness.

Requirement.—It shall leave by weight a residue of not more than 8 per cent. on the No. 100 sieve, and not more than 25 per cent. on the No. 200 sieve.

Significance.—It is generally accepted that the coarser particles in cement are practically inert, and it is only the extremely fine powder that possesses adhesive or cementing qualities. The more finely cement is pulverized, all other conditions being the same, the more sand it will carry and produce a mortar of a given strength.

The degree of final pulverization which the cement receives at the place of manufacture is ascertained by measuring the residue retained on certain sieves. Those known as the No. 100 and No. 200 sieves are recommended for this purpose.

Apparatus.—The sieves should be circular, about 20 cm. (7.87 inches) in diameter, 6 cm. (2.36 inches) high, and provided with a pan 5 cm. (1.97 inches) deep, and a cover. The wire cloth should be of brass wire having the following diameters: No. 100, 0.0045 inches; No. 200, 0.0024 inches. This cloth should be mounted on the frames without distortion, the mesh should be regular in spacing, and be within the following limits: No. 100, 96 to 100 meshes to the lineal inch; No. 200, 188 to 200 meshes to the lineal inch. Fifty gr. (1.76 oz.) or 100 gr. (3.52 oz.) should be used for the test, and dried at a temperature of 100 degrees Cent. (212 degrees Fahr.) prior to sieving.

The thoroughly dried and coarsely screened sample is weighed and placed on the No. 200 sieve, which, with pan and cover attached, is held in one hand in a slightly inclined position, and moved forward and backward, at the same time striking the pan gently with the palm of the other hand, at the rate of about 200 strokes per minute. The operation is continued until not more than one-tenth of one per cent. passes through after one minute of continuous sieving. The residue is weighed, then placed on the No. 100 sieve and the operation repeated. The work may be expedited by placing in the sieve a small quantity of large steel shot. The results should be reported to the nearest tenth of one per cent.

Time of Setting.

Requirements.—It shall not develop initial set in less than thirty minutes, and must develop hard set in not less than one hour, nor more than ten hours.

Significance.—The object of this test is to determine the time which elapses from the moment the water is added until the paste ceases to be fluid and plastic (called the "initial set") and also the time required for it to acquire a certain degree of hardness (called the "final" or "hard set"). The former is the more important, since, with the commencement of setting, the process of crystallization or hardening is said to begin. As a disturbance of this process may produce a loss of strength, it is desirable to complete the operation of mixing and moulding, or incorporating the mortar into the work, before the cement begins to set.

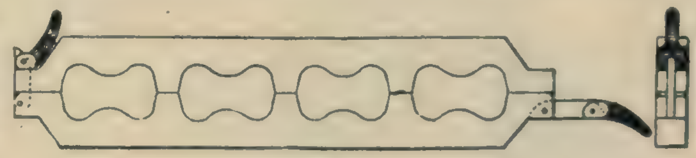


Fig. 2.

It should be borne in mind that chemical action begins as soon as water is added to the cement, and that a very quick setting cement may be killed by prolonged mixing or disturbance, also that the time of setting may be greatly prolonged by gauging with excess of water and excessive working when preparing the test pat, and that if care is not taken in making the test, a dangerously quick setting cement may be wrongly accepted. The time of setting is also materially affected by temperature. Care should therefore be taken to have the room, cement, and gauging water as near to 70 degrees Fahr. before starting the test as possible. In damp weather the cement should be dried before weighing and gauging for setting test.

With a view to detecting dangerously quick setting cement, it is recommended that a definite percentage of water should be used in gauging, as follows: For a cement 75 per cent. of which will pass a No. 200 sieve, 22 per cent. of water, and an additional 1 per cent. of water, for each extra 5 per cent. of cement that will pass the No. 200 sieve.

In preparing pats for this test, mixing should be done on a non-absorbent surface, preferably plate glass. The dry cement should be carefully weighed, and placed on the glass with a crater formed, so that the water can all be placed in the centre. When adding the water, accurately note the time. Then with a small trowel mix the cement and water into a paste, working rapidly and thoroughly with the side of the trowel for a period of one minute. Form quickly into a ball with the hands and place on the glass, flattening down with the trowel into a circular pat about 3 inches diameter ½-inch thick in the centre, tapering to a thin edge (this pat may also be used for soundness test). The time from adding the water, to the finished pat, should not be less than 70 seconds, nor more than 80 seconds. Place a damp cloth over the pat, but not in contact with it. The cement shall be considered as having taken "initial set" when a wire 1-12-inch diameter, loaded to weigh ¼-pound, shall leave a distinct mark on the pat but not appreciably penetrate the surface, and the "final" or "hard set" when a wire 1-24-inch diameter, loaded to weigh 1 pound, shall leave a distinct mark, but not appreciably penetrate the surface.

Standard Sand.

Natural sand from Ottawa, Illinois, screened to pass a sieve having 20 meshes to the lineal inch, and retained on a screen having 30 meshes to the lineal inch, is recommended in preference to the standard quartz sand generally used. For field tests, good sharp river sand, screened to pass a sieve having 20 meshes to the lineal inch, and retained on a sieve having 30 meshes to the lineal inch, may be used. This sand should in all cases be washed clean before being used. As sand obtained in this way cannot be considered standard, results should be considered as approximate only.

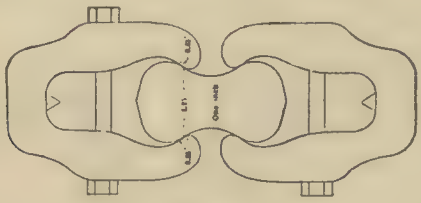


Fig. 3.

Form of Briquette.

The form of briquette recommended is shown in Fig. No. 1.

Moulds.

The moulds should be made of brass, bronze, or some other equally non-corrodible material, and made sufficiently rigid to prevent spreading during moulding of briquette. They may be either the gang pattern, fig. 2, or single. The moulds should be kept clean, and wiped with an oily cloth before the cement paste or mortar is placed in them.

Mixing and Moulding.

All proportions should be stated by weight. The quantity of water to be used should be stated as a percentage of the dry material. The metric system is recommended because of the convenient relation of the gramme and the cubic centimeter. The temperature of the room and the mixing water should be as near 21 degrees cent. (70 degrees Fahr.) as it is practicable to maintain it. The sand and cement should be thoroughly mixed dry. The mixing should be done on some non absorbing surface, preferably plate glass. The quantity of material to be mixed at one time depends on the number of test pieces to be made; about 1000 gr. (35.28 oz.) makes a convenient quantity to mix, especially by hand methods. In making briquettes for tensile tests, use just sufficient water to make a stiff paste or mortar, which can be sufficiently well pressed into the moulds with the thumbs to make a dense briquette, and with just sufficient moisture on the surface to show bright when the briquette is troweled off. A sand-glass is recommended as a convenient means of noting the time of mixing, and rubber gloves should be used when mixing with the hands.

Weigh the material and place on the mixing table, forming a crater in the centre, into which the proper percentage of clean water is to be poured. Add the water, carefully noting the time, or setting the sand-glass, then quickly turn the material from the outer edge into the crater with the aid of a trowel, thoroughly incorporating the water with the other material, taking one minute from the time of adding the water to perform this part of the work. Then complete the operation by vigorously kneading the mixture with the hands for an additional period of one and one-half minutes. Place carefully into the mould, pressing in firmly with the thumbs, heaping the mortar slightly above the mould. The trowel should then be drawn over the mould in such a manner as to exert a moderate pressure on the excess material. Reverse the mould, and trowel the other surface of the briquette in the same manner, leaving the surface truly level with the face of the mould.

A check upon uniformity of mixing and moulding is afforded by weighing the briquette just prior to immersion, or upon removal from the moist closet. Briquettes which may vary in weight more than 3 per cent. from the average should not be tested.

Storage of Test Pieces.

During the first 24 hours after moulding, the test pieces should be kept in moist air to prevent them from drying out. A moist closet or chamber is so easily devised that the use of the damp cloth should be abandoned if possible. Covering the test pieces with a damp cloth is objectionable, as commonly used, because the cloth may dry out unequally, and in consequence, the test pieces are not all maintained under the same condition. Where a moist closet is not available a cloth may be used, and kept uniformly wet by immersing the ends in water. It should be kept from direct contact with the test pieces by means of a wire screen or some similar arrangement.

A moist closet consists of a soapstone or slate box, or a metal-lined wooden box—the metal lining being covered with felt, and this felt being kept wet. The bottom of the box is so constructed as to hold water, and the sides are provided with cleats for holding glass shelves on which to place the briquettes. Care should be taken to keep the air in the closet uniformly moist.

After 24 hours in moist air the test pieces for longer periods of time should be immersed in water maintained as near 21 degrees Cent. (70 degrees Fahr.) as practicable. They may be stored in tanks or pans, which should be of non-corrodible material.

Tensile Strength.

Requirement.—The minimum requirements for tensile strength for briquettes one inch square in section shall be within the following limits, and shall show no retrogression in strength within the periods specified:

Neat Cement.

Age	Strength.
24 hours in moist air	150-200 lbs.
7 days (1 day in moist air, 6 days in water)	450-550 lbs.
28 days (1 day in moist air, 27 days in water)	550-650 lbs.
7 days (1 day in moist air, 6 days in water)	150-200 lbs.
28 days (1 day in moist air, 27 days in water)	200-300 lbs.

If the minimum strength is not specified the mean of the above values will be taken as the minimum strength required.

The tests may be made on any standard machine. A solid metal clip, as shown in fig. 3, is recommended. This clip is to be used without cushioning at the points of contact with the test specimen. The bearing at each point of contact should be ¼-inch wide, and the distance between the centre of contact on the same clip should be 1¼-inch.

Test pieces should be broken as soon as they are removed from the water. Care should be observed in centreing the briquette in the testing machine, as cross-strains produced by improper centreing tend to lower the breaking strength. The load should not be applied too suddenly, as it may produce vibration, the shock from which often breaks the briquette before the ultimate strength is reached. Care must be taken that the clips and the sides of the briquette be clean from grains of sand or dirt, which would prevent a good bearing. The load should be applied at the rate of 600 pounds per minute. The average of not less than three briquettes of each sample tested should be taken as the test, excluding any results which are manifestly faulty.

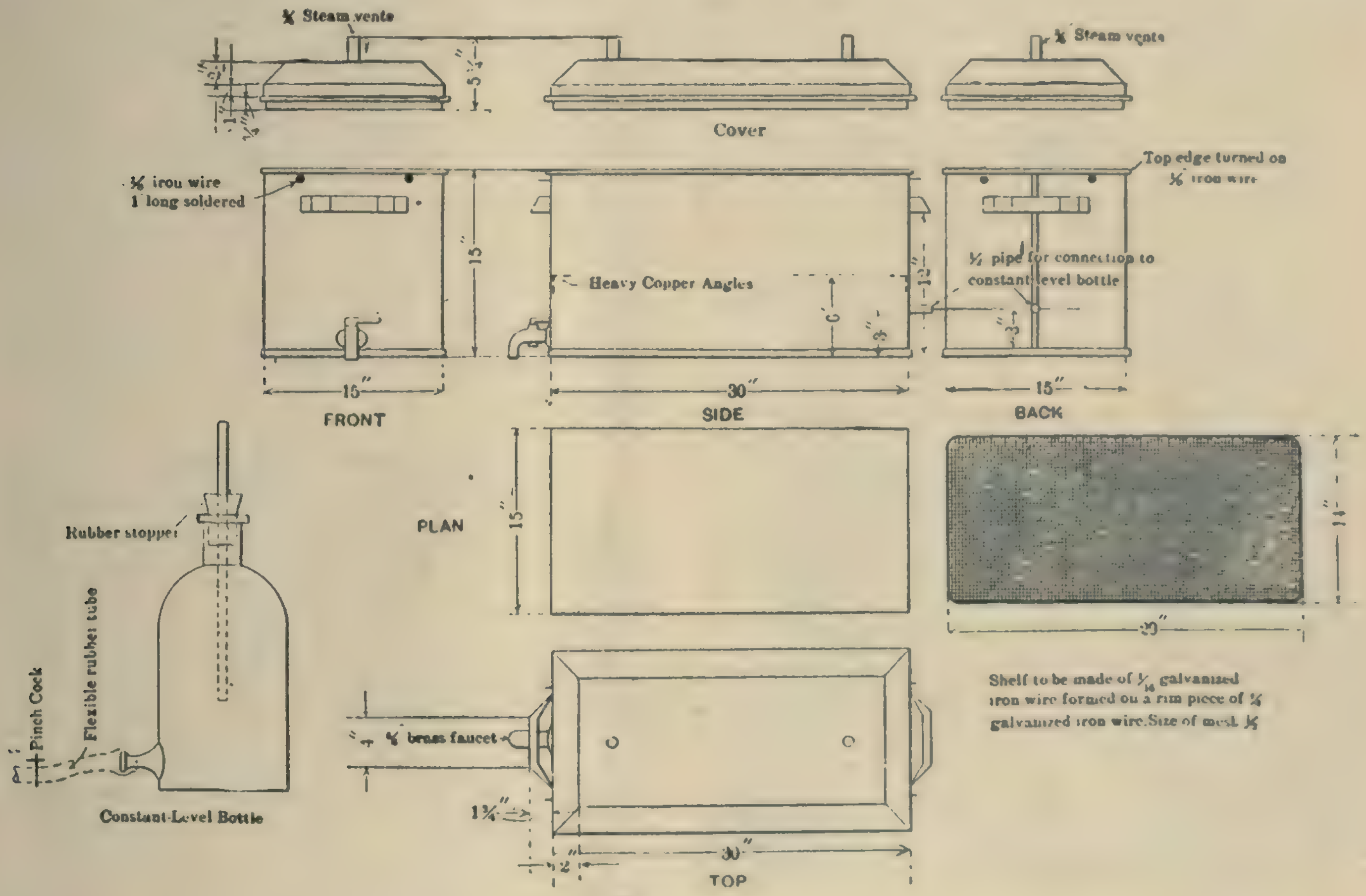

⅜ Steam vents
⅜ Steam vents
5¼″
Cover
⅜ iron wire 1 long soldered
Top edge turned on ⅜ iron wire
15″
Heavy Copper Angles
½ pipe for connection to constant level bottle
12″
6″
3″
3″
15″
30″
15″
FRONT
SIDE
BACK
15″
PLAN
14″
29″
Rubber stopper
Flexible rubber tube
Pinch Cock
Constant-Level Bottle
⅜ brass faucet
1¾″
2″
30″
TOP
Shelf to be made of 1/16 galvanized iron wire formed on a rim piece of ⅜ galvanized iron wire. Size of mesh ⅜

Fig. 4.

Constancy of Volume.

Significance.—The object is to develop those qualities which tend to destroy the strength and durability of a cement. As it is highly essential to determine such qualities at once, tests of this character are, for the most part, made in a very short time, and are known, therefore, as accelerated tests. Failure is revealed by cracking, checking, swelling or disintegration, or all of these phenomena. A cement which remains perfectly sound is said to be of constant volume.

Methods.—tests for constancy of volume are divided into two classes: (1) Normal tests, or those made in either air or water, maintained at about 21 degrees Cent. (70 degrees Fahr.), and (2) Accelerated tests, or those made in air, steam or water at a temperature of 45 degrees Cent. (115 degrees Fahr.), and upward. The test pieces should be allowed to remain 24 hours in moist air before immersion in water or steam, or preservation in air. For these tests, pats about 7½ cm. (2.95 inches) in diameter, 1¼ cm. (0.49 inches) thick at the centre, and tapering to a thin edge should be made upon a clean glass plate about 10 cm. (3.94 inches) square. These pats are to be prepared in the same manner and with the same percentage of water as pats for setting tests.

Normal Test.—A pat is immersed in water maintained as near to 21 degrees Cent. (70 degrees Fahr.) as possible for 28 days, and observed at intervals. A similar pat after 24 hours in moist air is maintained in air at ordinary temperature and observed at intervals.

Accelerated Test.—A pat is exposed in any convenient way in an atmosphere of steam, above boiling water in a loosely closed vessel for 5 hours. The apparatus recommended by the committee of the American Society of Civil Engineers for making these determinations, and shown in fig. 4, is also recommended by your committee. To pass these tests satisfactorily the pats should remain firm and hard, and show no signs of cracking, distortion or disintegration. Should the pat leave the plate, distortion may be detected best with a straight-edge applied to the surface which was in contact with the plate. In the present state of our knowledge it cannot be said that cement should necessarily be condemned simply for failure to pass the accelerated tests, nor can a cement be considered entirely satisfactory, simply because it has passed these tests.

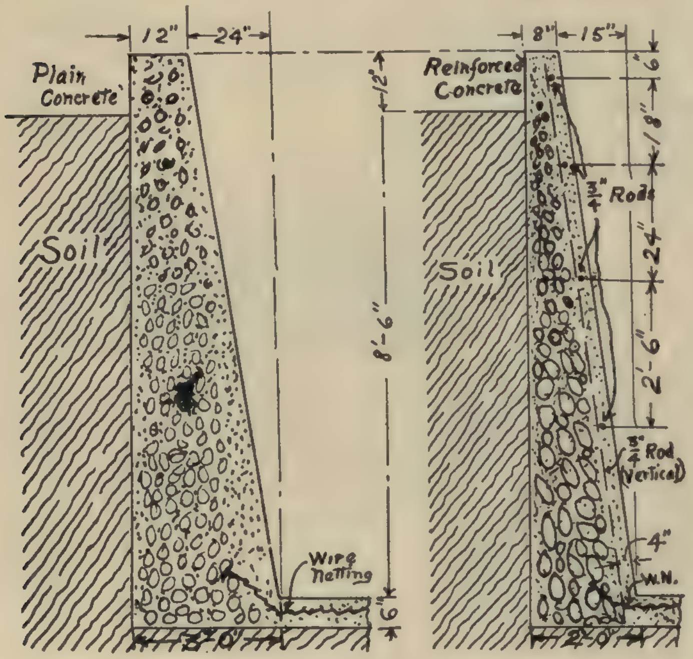
Practical Suggestions for the Use of Builders

Construction of Concrete Wall for Basin—Gambrel Roof House, a Pleasing Innovation.

Concrete Wall for Basin

A contractor recently wanted to build a reservoir 24 feet by 30 feet by 9 feet 6 inches inside measure, banked up on outside within a foot of top with dirt, sides built 3 feet wide at bottom, 1 foot at top; bottom 6 inches thick; four iron rods (¾-inch) in each side of wall laid lengthways to reinforced concrete, with the following materials: Clean river sand, 3 parts; cement, Portland, 1 part; all the small gravel and stone this will hold. Bed is to be proofed by Sylvester process. In reply to an enquiry, he was given the following information upon the subject by Fred W. Hagloch, in the "American Carpenter and Builder":

In constructing a concrete wall for a basin 24 feet by 36 feet by 9 feet 6 inches deep there is little pressure strain on the wall when same is filled, as the soil on one side and the water on the other equalize each other. If the basin is always full of water a 4-inch concrete wall would do; but, as the basin may be drained at times, a retaining wall for the soil is essential. This is shown in the two sketches, both the plain and reinforced concrete being about equal strength; either will withstand four times the strain a basin of above dimensions can thrust upon it.



Detail of Concrete Wall.

If the plain concrete is used, the composition should consist of one part cement, three parts sand and five parts gravel of pea to walnut size, together with some larger stones. Before leaving a day's work, rods, pipes, or other irons about one inch thick and one foot long, should be set half their length into the concrete, letting the other half project above, thus keying the various batches of concrete together. These keys are set in the centre of the wall and spaced three to four feet centres. Do not save labor in tamping the concrete into the forms.

For the reinforced wall use one part cement, two parts sand and four parts pea to walnut gravel, and add moistened stone same as for plain concrete. Place steel rods as shown. Should the strongest work possible be desired, no stone over six-inch diameter should be thrown into the concrete, which will admit placing the vertical rods within four inches of the soil side of the wall. In this position they will act as a counterfort and be stronger The vertical rods should be placed four feet centres and should be tied to the top horizontal rod with No. 8 wire.

Always make work continuous with as little delay as possible unles keyed together as mentioned above. Tamp hard and keep well moistened for six or eight days, when the forms may be removed. The water side of the wall should then be plastered with a fourth inch coat of one part cement and two parts sand mixed to the consistency of stiff mortar; wet the walls well just before plastering and keep moist for a week. When dry add two applications of waterproofing.

The bottom should be six inches thick of same concrete as for walls and a wire fence netting of six-inch mesh should be placed not less than two inches below top of concrete as shown. Finish with plaster and waterproofing, same as wall.

The Gambrel Roof House

Many people when they come to build a house for themselves—and we can not blame them for the feeling—want something "different," a house practical and homelike, but at the same time one different from the ordinary straight, square house, says L. P. Hicks, in the "American Carpenter and Builder."

As ordinarily constructed, however, the sloping sides cut into the second storey rooms, taking away much valuable space that ought to go into the rooms, but which has to be sacrificed on account of the gambrel roof. To plaster up on the sloping side walls makes the room in such shape that it is an ungainly thing to furnish, it never being possible to use the side of the room next to the roof to advantage.

So, to erect a house with a gambrel roof, not sacrificing valuable floor space on the second floor, is an interesting problem.

The first rafters of the gambrel-roof house should slope in from 24 to 30 inches to produce the proper outside appearance. Now, if these rafters start from the plate, directly over the first storey, we have either sloping side walls, which are objectionable, or else upstairs rooms fully two feet smaller all the way around than those on the first floor. If, however, we extend the second storey joist over the plate sufficiently to make the cornice, fig. 1, and then set a plate on top of the floor joists, setting the same in about 8 inches, with the studding for the second storey on it, cutting in the sloping rafters to bear on the ends of the extended floor joists and against the perpendicular studding, then we have the proper gambrel-roof effect on the outside walls; and on the inside we have as nice square rooms as can be had in any house. Moreover, instead of sacrificing 24 inches of space all along both sides of the house, we have lost only about 8 inches space on each side.

Dormers can be cut in this kind of a house very easily and without making any deep cuts into the rooms. It is the most satisfactory and economical way to build a gambrel-roof house. It insures a good strong job, since the sloping rafters on the first section of the roof serve as braces as well as rafters; it is nearly as strong as the hip roof.

The gambrel-roof house, besides cutting down the room upstairs to some extent, increases the cost of the building in the matter of labor. This is due to the extra amount of piecework necessarily required in the construction. It is safe to say that a gambrel-roof house will cost at least $100 more to build than a square house of the same dimensions, houses, say, of 24 by 30 feet floor space in size.

Figure 1 shows the general construction as regards the pitch of the two sections of the roof, height of storeys and the setting of the studding for the outside wall on the second floor. Fig. 2 is an enlarged detail of the cornice construction, showing the cornice mouldings and roof gutter. An eave gutter can be substituted for the roof gutter if it is desired. On this kind of a roof there is no difficulty in getting all the pitch for the gutter that is required.

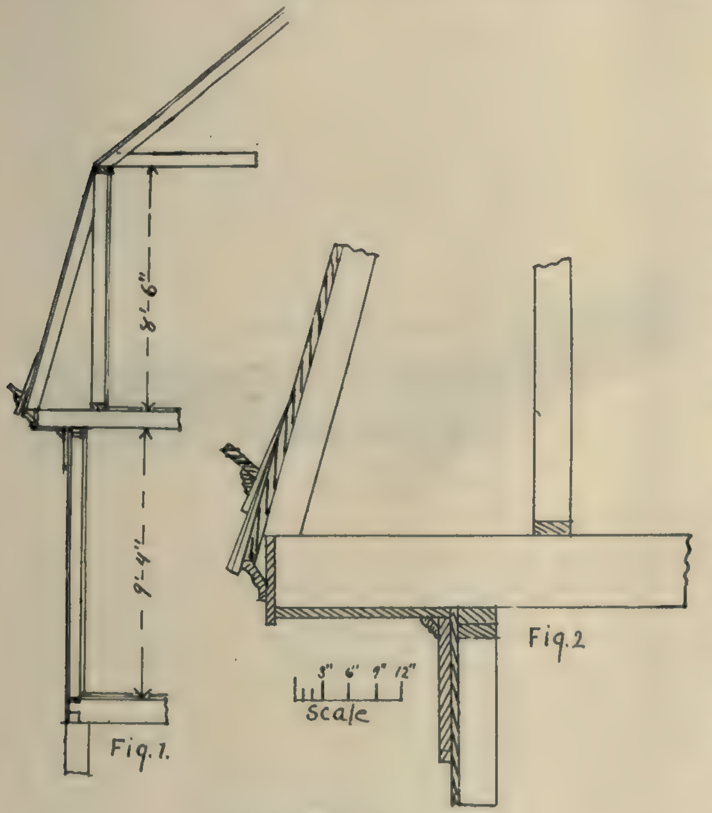


Fig. 1.

Fig. 2

Gambrel Roof Construction.

Unique Pumping Station

To prevent the flooding of a low area at Southsea, England, in times of severe storm, an automatically operated pumping station has recently been built. It consists of a concrete pump and machinery lying entirely beneath ground level, and receiving the overflow from weirs at different points of the sewerage system in the flooded area. There are two motor-driven centrifugal pumps, each with a capacity of 200,000 gallons per hour against a head of 30 feet. The pumps are started and stopped by float-operated switches, one of the pumps being first thrown in and the other one later in case the first pump is unable to handle the flow coming to the sump.

Effects of Weather Upon Chimneys

Professor Nussbaum calls attention in the "Gesundheits-Ingenieur" to the influence of the weather on the exposed walls of chimneys, and he shows that great injury is caused to the draft by the percolation of moisture, and by the neglect of precautions to render the outer walls impervious. He therefore advocates the employment of a damp-proof coating on the exteriors of all chimneys, and the addition of a hood or covered cap at the top, so as to exclude the rain. It is shown that when moisture reaches the inner wall of the chimney much of the useful effect of the up-rush of hot air current is expended in converting the water into vapor, and, owing to the lateral cooling of one side more than the other, in the case of lofty chimneys, eddies and counter currents are liable to be formed which greatly reduce the draft. The professor states that, as the results of practical experiments, he has found that the cost of protecting the chimney in the manner he advocates will speedily be repaid by the improved efficiency.

Cost of Wood Pavements in Paris

In a paper on the pavements of Paris, submitted to the International Road Congress, Mr. M. P. Tur, who has charge of such work there, stated that the average cost of wood block pavements in that city can be itemized as follows: Grading, 16 to 40 cents per square yard, according to the nature of the previous roadway; concrete base, 58.4 cents; mortar coat, 8.8 cents; creosoted soft-pine blocks, 5 inches deep, $1.60; labor, 18.4 cents; furnishing and spreading screenings, 6.4 cents; inspection, 4 cents; total, $2.72 to $2.96. He states that on streets of considerable traffic where there are street railways, wood pavement lasts not more than seven or eight years, but on some streets the life may be ten years, or an average of nine years in all. The cost of relaying he estimates as follows: Hauling away old blocks, 12 cents; new blocks, $1.60; labor, 18.4 cents; furnishing and spreading screenings, 6.4 cents; cost of inspection, 4 cents; total per square yard, $2.008. This amounts to an average cost of 22.4 cents a year, to which must be added the cost of maintenance, 4.8 cents a year, to which he also adds 12 cents for cleaning. He winds up by saying that, in reality, in Paris, the actual expense of maintenance is somewhat lower than the figures given above, as funds are not available for keeping the pavement in good condition.

Mr. Tur states that the material used in impregnatting the blocks is a heavy oil "which is improperly called 'creosote'." This heavy oil ordinarily would contain at least 13 per cent. of creosote products, and more than 8 per cent. of naphthalene in the winter and 13 per cent. in the summer. The impregnation thus obtained is very superficial, and the penetration of the oil does not exceed a few millimeters. The utility of the operation is, therefore, contested." The impregnation is conducted by the city itself, in its own plant, and it furnishes the blocks to the contractor.

In considering the estimates for the year, the Toronto Board of Control have evolved a proposition to submit a by-law to the ratepayers for $100,000 to carry out a plan of permanent improvements on the Island that will make it one of the most attractive amusement and recreation parks on the continent.

Cement users should not be too sure that high tensile tests mean free lime. They often mean better cement, especially if it is a rotary kiln product.

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

Septic Tank Sewage System

The disposal of sewage by means of septic tanks has been engaging considerable attention lately. In an interesting article recently contributed to "The Furrow," Mr. L. B. Kuhn describes a system which is said to have been of accidental discovery and to have first been put into successful practice at Watertown, Ill.

The system consists of two oblong tanks of 70,000 gallons capacity each, placed side by side, one tank emptying into the other through a pipe. For all practical purposes, however, one tank with a weir box at one end is exactly as good as two tanks, as it has been found that the water as it emerges from the first tank is just as pure as after it has passed through the second tank. The object of this weir box is to check the overflow and prevent any agitation of the sewage in the tank.

The tanks in this system are located about a quarter of a mile from the buildings. They might be located 40 feet or four miles away, according to convenience, as the result would be the same.

The sewage tank, as shown in the illustration, consists of a brick box with 8-inch walls and floor, lined within and without with cement. Concrete would make a better tank. The roof is made air-tight with a heavy coating of pitch, and all crevices are tightly sealed with the same material. The sewer inlet is about 2 feet below the surface of the sewage in the tank. A short distance from the opposite end of the tank a cross wall is built, having a narrow opening extending across the tank on a level with the inlet. This opening has little if any greater capacity than the inlet. Such an opening causes less current in discharging than would a circular opening.

In the end wall is a row of curved tile so placed that the outlets are 2 feet above the sewer inlet and the opening in the cross wall. The cross wall forms a weir, or dam, which retards the outflow from the main tank, and, of course, there can be no discharge until the contents of the tank and weir box reach the level of the curved tile outlets. Thus both inlet and outlet are submerged about 2 feet below the surface of the sewage in the tank.

The filter box is filled with sand and gravel, and has an outlet at the bottom through which the water finally discharges.

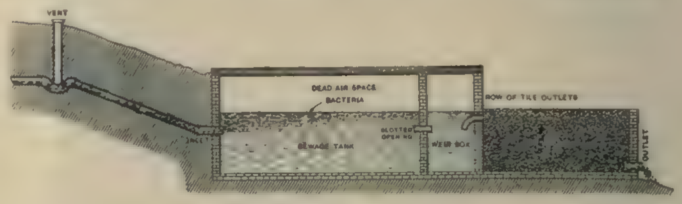
The operation of this system is exceedingly simple. The sewage entering the tank remains until it fills the tank and the weir box to a level with the overflow from the curved tile outlets. In 24 hours or a little over, after entering the tank, a scum will have formed on the surface, 1 inch or more in thickness, consisting of a solid mass of filth bacteria, which preys upon the poisonous matter and the solids contained in the sewage, constantly fighting among themselves and destroying each other like the Kilkenny cats, which devoured eath other until nothing was left but the tail, the tail in this case being represented by the 2 per cent. of poisonous matter left in the water as it escapes, and which is at once eliminated upon exposure to the atmosphere.

Light and air are fatal to these bacteria, hence the necessity of keeping them in a dark, air tight place that they may accomplish their work. For this reason the tank must be air tight. Again, to do their work effectively they must be left in perfect quiet, hence the inlet and outlet are submerged below the surface in order that from inflow and outflow as little current as possible may be caused, and this quiet is further assured by means of the weir box.

Upon emerging from the tiles the water is clear, and by chemical analysis is found to contain but 2 per cent. of bacteria, that would be in the slightest degree injurious to the human system. This water is allowed to filter through the sand and gravel, its exposure in this manner to the air destroying all remaining bacteria.

A system of this kind will not freeze in winter, as the gases arising from the sewage in the tank generate enough heat to counteract the cold and prevent freezing. The water as it emerges will be found much warmer than the air in cold weather.

In cases where the sewage discharge is scanty and intermittent there might be danger of the water freezing in the filter box during a long cold spell, and then it would be advisable to erect a small tight building, well protected from frost, over the whole outfit, including both tank and filter, but when the sewer is in constant use this would be unnecessary



Section of Tank and Filter Box.

The secret, if secret it may be called, of the whole system is the dark air tight tank, the submerged inlet and submerged outlet, and that is all there is to it. The bacteria will do their work if let alone. If stirred up they refuse to perform as desired. When properly working the tank might be opened, the bottom scraped and not a handful of solid matter could be found.

The tank should be large enough to hold all the sewage that is ever likely to run into it within a period of 24 to 36 hours. For a private residence this would rarely need to be larger than 3 feet wide, 6 feet deep and 8 to 10 feet long.

Macadamized Roads and Their Maintenance

A recent number of the "Scientific American" contains an excellent article upon the reasons why macadamized roads are a failure in the United States, and, as the question of good roads is compelling the interest of many municipalities throughout Canada, a synopsis of the same will doubtless prove of interest:

The magnificent macadamized roads of Europe are the admiration of all visitors from this continent. Scientifically constructed and most diligently repaired and maintained, they provide to-day, as they have provided in many cases for centuries, a smooth, hard, and well-drained surface, which never varies in its excellence from season to season, or from year to year.

Here in America the art of macadamized road building, at least on a scale of any magnitude, is of comparatively recent date. Such roads as we have constructed have been built, as a rule, under experienced engineers, and according to those principles which have been so thoroughly tested in Europe. Generally our new roads, on their completion, are of excellent quality. The work is so well down that there is no reason why, with proper maintenance, they should not show the same wearing qualities as similar roads abroad.

As a matter of fact, in the majority of cases, our roads, after a single season's wear, begin to show serious signs of going to pieces, and frequently after two or three season's wear, have lapsed into a condition that is little better than that of a common country dirt road. If the top dressing has not disappeared entirely, it will be found in the shape of a deep layer of dust and fine stone at each side of the roadway; the stripped surface will be worn more or less deeply into ruts, or hammered into hollows, and not infrequently the underlying courses of large broken stone and rock will be clearly discernible.

Why do our macadam roads go to pieces so swiftly, while those in Europe maintain their fine surface indefinitely? The answer is to be found in the fact that in Europe they have a careful system of road maintenance, while on this continent we have none, or practically none. European road-builders and supervisors, or whatever they may be called, clearly understand that there is no engineering work that depends more absolutely for its integrity and permanence upon careful attention and upkeep than does a macadamized highway. Hence the work of keeping up the European roads is being done all the time in many places and by a large army of individual laborers.

Here, in America, we know little or nothing of such road maintenance as this. No sooner is a stretch of new road accepted and paid for, than it is left to the tender mercies of the traffic and the weather. Incipient ruts and hollows, instead of receiving the immediate care of the road mender, are allowed to remain full of the standing water of the last rainstorm, and are quickly deepened and widened by the wear of the passing traffic. When the work of destruction has proceeded unhindered to a certain stage of ruin, the road is given a wholesale repair, by dumping upon it a few hundred tons of top dressing, which is left to be crushed down into the irregular and ragged surface beneath by such haphazard rolling as may be given by passing traffic.

In the present campaign of "good roads" education, more attention should be paid to the vital function of road maintenance. Our present practice of building a first-class road and then letting it go to ruin as fast as wind, weather, and traffic can wreck it, is the height of folly and extravagance.

Brick or Concrete for Sewer Construction?

In a letter to the Chief Engineer of Sewers, of Brooklyn, N.Y., City Engineer Rust asked for an opinion on the advisability of using brick or concrete in the construction of large sewers, and in a letter from Mr. Edwin J. Frost, Brooklyn's engineer, the result of that city's experience is given. Mr. Frost says:

"In the majority of cases in concrete sewers the invert is lined with brick. In many cases bids for concrete without reinforcement have been the lowest received There have been no failures of such sewers, and we are building at the present time outlet sewers from 12 feet to 15 feet in diameter (in one case larger than this), of this material. Sewers of either material, if properly built, I consider entirely satisfactory. Concrete has the advantage, in some cases, of presenting a smoother surface than brick. Concrete sewers which have failed are in all cases old sewers, and are of the smaller sizes, say from 12 inches to 24 inches in diameter. They are laid as pipe in three-foot lengths, and the workmanship and material used were not of the best. Wherever acid matter has access to the sewer concrete is not a suitable material, but in large outlets where such waste is greatly diluted I do not believe any harm can result."

A New Road Material

An automatic road which, when worn to dust, forms cement again with the rain, is what George W. Cooley, Minnesota Highway Engineer, hopes that he has found after experiments for several months. By the use of limestone of small dimensions mixed with harder stone the experiments seem to show that a new use for a common stone. Powdered limestone was mixed with gravel and water. The mixture formed a stone-like mass, which was broken with difficulty. The whole mass was reduced to powder and again cemented with water. The qualities in the limestone seem to make a firmer mixture with each breaking up. One briquette has been broken up five times and has again hardened.

Limestone is now used on macadam roads, but the finer article mixed with gravel or granite as the base for a road, is predicted by Mr .Cooley as one of the coming materials in road making.

Bridge Construction in Elgin County

The report submitted to the Elgin County Council by Engineer Bell, of St. Thomas, Ont., contains a list of the bridges constructed during the year, also the wooden bridges still left in the county. The new bridges and the cost of each are, the Queen's bridge, between city and county, entirely finished cost $9,433.70; Brewery bridge, $10,302.02; Bothwell bridge, repaired, the county cost 27½ per cent., $557.36; Otter bridge, near Tillsonburg, has also been completed but as yet has not been inspected. The wooden bridges left are the Corn road bridge over the Thames, Gillett's bridge over Catfish Creek, Yarmouth; Belmont bridge, between Elgin and Middlesex; Filmore bridge, over Catfish Creek in Bayham; Port Burwel bridge over Catfish Creek; Jamestown bridge over Catfish Creek; Dodd's bridge, Southwold, over Kettle Creek, and several smaller ones, because of their length, are in danger of not supporting the weight of a traction engine. It will be absolutely necessary, according to Engineer Bell, to build the Jamestown bridge, while in the others the council will have to use their own judgment. The structures are strong enough for ordinary traffic but not for traction engines.

A bill has been passed by the Alberta Legislature empowering municipalities to sell debentures at a price less than the amount expressed by the by-law relating to the issue, unless expressly prohibited from doing so. It also empowers the purchaser to recover from the municipality the face value and interest of the debentures bought. The present bill does not in any way conflict or change previously existing laws.

The new Winnipeg directory contains 54,783 names, or 6,133 more than the previous volume. The estimated population of the city is 157,885, as against 139,860 in 1908. Last year 1,171 buildings were erected there at a cost of $6,371,140. The assessment for 118,252 persons last year was $116,101,390.

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Plumbing for Public Schools

Among the interesting papers presented at the Chicago meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers was one on the above subject by C. M. McHugh, of Cedar Rapids, which we print herewith.

In the year 1902 a plumbing ordinance was passed and a plumbing inspector appointed by the City Council of Cedar Rapids; and in the year 1904 one of our public schools was enlarged and remodeled throughout with plumbing. The architect had drawn plans and specifications for a latrine system of plumbing, but as this did not comply with the requirements of our plumbing ordinance exactly, I forbade its installation. I permitted, however, the installation of an individual double siphon closet range. But it was very little better than the latrine system, the only improvement being the enameled inside, a seal of water in the bowls, and the fact that it was somewhat easier to keep clean.

Two years ago we had another school remodeled, and as the range closets and the individual bowls in group fashion were something that we did not approve of with the experience that we had had in the past years, both in sanitary and moral respects, we communicated with several school boards in large cities throughout the country in regard to different styles of plumbing in public schools, but found none to suit the people of Cedar Rapids. We then thought that we would install a system of individual closets in individual rooms; one for the boys and one for the girls, off each schoolroom, and one enamel lavatory for the boys and one for the girls, properly ventilated in every form.

The closets are of the best hard burned, perfectly vitrified earthenware of the siphon wash down pattern, having heavy lugs for attaching of seats and low down tank. Each bowl has a connection off the bowl, three inches in diameter, for local ventilation. This vent connection is made of iron pipe, enameled inside and outside and connected to the closet bowl and vent shaft and continued up through the building.

The closet bowls are set on polished slab floors of pink Tennessee marble of the most dense and non-absorbent texture, 1⅛-inch thick and countersunk ¼-inch, which is kept clean very easily. In this way the pupils are under the control of their teacher while school is going on and have no opportunity to congregate in rooms where group closets are installed.

Objection to this arrangement might be raised on the ground that the closets would become insanitary fixtures by thus using them in place of urinals. But I find on close investigation of this system, which has been installed two years, that the closets are as clean as the day they were set, and but very little work is required by the janitors to take care of them, and not any more than under any other system. The relief from influences tending to coarseness is an element of the situation that should commend itself to the consideration of any one.

Again, it might be said that the stoppage of a closet of a school room in this style would cause inconvenience to the pupils of the room; but as there is usually an emergency closet on every floor of the building and sometimes two, for the use of the teachers, these could be used by the pupils of the room in which the closet was out of repair until their closets were repaired, which would be only a very short time. Another objection is perhaps this, that the stoppage of a closet would be liable to cause overflow and leakage to the other floor below, but this is a matter that can easily be taken care of while the plumbing is being installed, by the use of safe wastes.

Some might think that all sorts of trouble would be caused by delicacy on the part of the pupils to enter the closets while other pupils were in the room on account of the noise of the water when discharged from the tank, which would be so noticeable that a commotion would be caused in the schoolroom, but as the closets are located far from the schoolroom, the cloakrooms being between it and the toilet room, and as the closets are of the most noiseless construction, it causes no commotion whatever.

Taking it from a sanitary standpoint, a moral standpoint, and an educational standpoint, I consider it is a well fitted system for public schools. It will educate pupils to be cleaner and also give them an idea of how plumbing should be used in the schools and at their homes. It will make them more careful about the use of plumbing, for in case one pupil misuses the closet by stoppage or in any other way, or the lavatory, you may rest assured that the next pupil who enters the toilet room will be liable to report what had been done by mischief, for fear that he or she would be liable for the punishment of same; and taking the whole in consideration, I believe it to be the best for public school buildings that I know of.

When we installed this system of plumbing we first thought of removing the toilet rooms to a separate building some distance from the school, but we have seen that plan in operation in other public buildings and realize that it would not answer all purposes for which we want a school building.

We have 12 public school buildings, which contain an average of about 500 pupils to a school and about 36 or 37 pupils to a room. This system is ventilated with a forced ventilation from every toilet room and with local ventilation off the bowl. I have tested the air of the toilet rooms and find it to be much purer than I find it where group closets are placed.

Ventilating by Means of Air Spaces

Last season in erecting a building with hollow blocks the idea of ventilating the basement or cellar by means of the air spaces in the blocks was attempted. The results, after twelve months' test, have proven very satisfactory, especially during the rainy season last spring, it carrying off moisture not only from the cellar, but from the concrete walls as well, according to F. W. Haglock, in the "National Builder."

The blocks used were of the plain single air space type, laid mortar on the sides only, care being taken to leave horizontal air connections between the vertical openings. About a foot above the cellar floor a four by six-inch opening protected with a bronze wire fly screen was inserted, connecting the cellar with the dead air space, and about one foot below the roof an insertion was made on the outside of the wall. These openings were placed about six feet apart around the entire building. Lids were placed at each opening in the basement and during high winter winds it would be found necessary to close them.

That damp and musty air is impossible in this cellar is a certainty, also these walls, while not waterproofed, have little dampness to penetrate to the interior plaster. The cost is but a few dollars when done while the building is erected and but little more to place these vents on hollow block buildings already erected. On the latter the improvement is most noticeable, it drawing the dampness from the cellar and the exterior surface of the walls lose their drowned appearance after a rain in much less time. Let it be understood that it is not damp proof or damp resisting, but simply a damp remover, in which its results are all that could be desired.

Amount of Air Required for Ventilation

Under the general conditions of outdoor air, namely 70 degrees temperature and 70 per cent. complete saturation, an average adult man, when sitting at rest in an audience, makes 16 respirations per minute, writes F. H. Bryant in the "Architect and Engineer." Under the previously assumed conditions of 70 degrees temperature and 70 per cent. humidity, the air thus inhaled will consist of about one-fifth oxygen and four-fifths nitrogen, together with about 1 7-10 per cent. aqueous vapor and 4-1000 of a per cent, carbonic acid. By the process of respiration the air will, when exhaled, be found to have lost about one-fifth of its oxygen by the formation of carbonic acid, which will have increased about 1-100 fold, thus forming about 4 per cent., while water vapor will form about 5 per cent. of the volume. In addition, the inhaled air will have been warmed from 70 to 90 degrees, and, notwithstanding the increased proportion of carbonic acid—which is about one and one-half times heavier than air—will, owing to the increase of temperature and the levity of the water vapor, be about 3 per cent. lighter than when inhaled. Thus it will be seen that this vitiated air will not fall to the ground, as has often been presumed, but will naturally rise above the level of the breathing line, and the carbonic acid will immediately diffuse itself into the surrounding air. In addition to the carbonic acid exhaled in the process of respiration, a small amount is given off by the skin. Furthermore, one and one-half to two and one-half pounds of water are evaporated daily from the surface of the skin of a person in still life. If the air supply at 70 degrees is assumed to have a humidity of 70 per cent. and to be saturated when it leaves the body at a higher temperature, then at least four cubic feet of air per minute will be required to carry away this vapor.

Taking into consideration these various factors, it becomes evident that at least four and one-half cubic feet of fresh air will be required per minute for respiration and for the absorption of moisture and dilution of carbonic acid gas from the skin. This, however, is only on the assumption that any given quantity of air having fulfilled its office, is immediately removed without contamination of the surrounding atmosphere; but this condition is impossible, for the spent air from the lungs, containing about 400 parts of carbonic acid gas in 10,000, is immediately diffused in the atmosphere.

It must then be evident that ventilation is in effect but a process of dilution and that when the vitiation of the air discharged from the lungs is known and the degree of vitiation to be maintained in the apartments is decided ,the necessary constant supply of fresh air to maintain the standard may be very easily determined.

The absolute air volume to be supplied cannot be specified wtih certainty in advance, without a thorough knowledge of all the conditions and modifying circumstances—in fact, the climate, the construction of the building, the size of the rooms, the number of occupants, their healthfulness and their activity, together with the time during which the rooms are occupied, all have their direct influences. Under all these considerations, it is readily seen that no standard allowance can be made to suit all circumstances, and results will be satisfactory only in so far as the designer understandingly, with the knowledge of the various requirements as they have been given, makes such allowance. The following schedule of air supply, in cubic feet per hour, as proposed by Dr. Billings, is here presented as showing relatively the volumes recommended by him in different classes of buildings:

A four and one-half gas burner demands forty-five cubic feet of air per minute, and the resulting carbonic acid gas, unless sufficiently diluted, or immediately removed, will seriously vitiate the air. The introduction of modern methods of incandescent electric lighting has done much to simplify and facilitate the solution of problems in heating and ventilating.

The air volumes recommended for ventilation by various investigators of the past century show a constant increase in their quantity as the years progress. As good ventilation is only a relative term, depending largely on one's experience and the possibility of improvement, it must be evident that perfect ventilation in the broadest sense can only be secured in the open air. It is, therefore, the province of ventilation to approach as near this perfection as means and expediency will permit.

The basis of thirty cubic feet has been very generally adopted throughout the country, and is to-day recognized as the minimum volume to be provided in any system of ventilation worthy of the name. As the benefits of good ventilation are still further recognized and the ability of the fan to provide practically unlimited volumes of air is better appreciated, this limit will gradually rise until we may one day witness the compulsory provision of air for the purpose of ventilation in such volumes as to render improvement of no practical benefit.

Although the United States is the largest manufacturer and consumer of asbestos products in the world, the asbestos used in its factories comes almost wholly from Canada. The quantity mined in the United States is insignificant, the total output for 1907 being only 653 short tons—the smallest annual production since 1896. The cause of the decline is found in the better quality and the greater abundance and accessibility of the Canadian asbestos, which completely dominates the industry in the United States.

The "Contract Record" has been favored by the Macdonald Manufacturing Company, Limited, Toronto, with an artistic calendar for 1909, lithographed on tinware. The Macdonald Company are specialists in the line of plain and decorated tin boxes and signs, and advertising novelties of every description.

Public Works Estimates for the Current Year

Cost of Work Planned for Harbors and Rivers, Roads, Bridges, &c.

(Continued from last issue)

PUBLIC WORKS—CHARGEABLE TO INCOME.

Harbors and Rivers.

Nova Scotia:—Abercrombie Point wharf, reconstruction of, $4,700; Anderson's Cove, repairs to and extension of breakwater, $1,000; Annapolis, harbor improvements, ice piers, $45,000; Arisaig Harbor, repairs to wharf and breakwater, $1,500; Avonport pier, repairs, $2,000; Baddeck wharf, improvements, $1,500; Bay St. Lawrence Harbor, $5,800; Big Bras d'Or wharf, close piling and repairs, $2,000; Blue Rocks Harbor, improvements, $4,000; Cheverie breakwater, extension of, $4,500; Cow Bay (Port Morien), harbor improvements, $5,000; Cow Bay Run & Osbornes, breakwaters, $1,200; Cribbin's Point wharf, part renewal of superstructure, $3,300; Digby Harbor, improvements, including repairs and additions to pier, $30,000; Grand Etang, partial construction of channel protection works, $4,000; Harbors, rivers and bridges, general repairs and improvements, $30,000; Inverness (Broad Cove) Mines, harbor improvements, $4,700; Little Narrows, wharf, $1,200; Lower Jordan Bay, cutting channel through bar, $2,000; McPherson's Cove wharf, Great Bras d'Or Lake, $4,700; Minasville, wharf at Dalrymple Point, $9,000; Oyster Pond, additional protection works on both sides of entrance channel and dredging, $2,000; Petite Riviere, improvements and repairs to shear dam, etc., $1,000; Port Hastings wharf, $11,600; Port Maitland breakwater, re-enforcing block along its outer end, $4,800; Pugwash Harbor, to raise Government wharfs, $2,000; Quoddy Island, wharf, $1,000; Skinner's Cove, protection work and dredging, $6,000; South Lake, Lakevale, opening channel from Lake St. George's Bay, inclusive of protection work, $6,500; Sydney Harbor, wharf on south arm near Whitney pier, $10,000; Tangier Harbor, wharf extension, $1,000; Wallace bridge, wharf, $1,$$$; Yarmouth Harbor, improvements, $60,000.

Prince Edward Island:—Graham's Pond, repairs to and strengthening of piers at entrance to harbor, $1,000; Harbors, rivers and bridges, generally, repairs and improvements, $8,000; Hickey's Pier, repairs, $1,000; Miminegash Harbor, extension of northern breakwater, $2,250; Mount Stewart, wharf on Hillsboro River, $1,700; Naufrage Pond, protected entrance channel, $14,500; New London, repairs to breakwater, etc., $1,800; Nine Mile Creek wharf, repairs, $1,300; Rustico Harbor, breakwater on Robinson's Island south side of entrance to harbor, $1,250; Sturgeon Pier, enlarging outer end and raising stem of pier, $4,500; Summerside Harbor, breakwater, $27,000; Tignish, extens,on of harbor channel protection piers inwardly, $25,000; Vernon River bridge (Port Vernon), landing pier on west side of river, $8,000; Wood Islands, improvements to harbor works, $3,000.

New Brunswick:—Beaver Harbor, wharf, $10,000; Buctouche, channel through beach, $2,500; Campbellton deep water wharf, extension, repairs, etc., $25,000; Cape Bald, breakwater pier, $15,000; Cape Tormentine breakwater, $5,000; Cumming's Cove, Deer Island, wharf, $23,000; Dover, wharfs on Petitcodiac River, $3,000; Grand Anse breakwater, to complete connection with shore, $1,500; Great Salmon River, groyne and breakwater combined, $1,500; Harbors, rivers and bridges, generally, repairs and improvements, $17,000; Harvey Bank, wharf, $4,500; Heron Island, wharf, $3,000; Kouchibougouac, harbor improvements, $3,700; Lameque wharf, improvements, $2,500; Leonardsville, Deer Island, reconstruction and extension of wharf, $14,000; Lorneville breakwater, wharf, $29,000; Mill's Point, wharf, $3,800; Moncton wharf, enlargement, $16,000; North Head, Grand Manan, breakwater wharf, $7,000; Pink Rock wharf, Shepody Bay, extension of, $10,500; Point du Chene, repairs to breakwater, $5,000; Quaco Harbor, part reconstruction and extension of east pier, $35,000; Richibucto Cape, breakwater wharf, $10,000; Richibucto wharf, repairs, etc., $3,000; River St. John, including tributaries, $6,000; River St. John and tributaries, construction of wharfs in tidal waters, $20,000; River St. John, wharfs in tide water, contribution to local government not to exceed one-half the first cost of wharfs built by it, $5,000; River St. John, survey between Fredericton and Woodstock, with a view of improving navigation, $5,000; St. Andrews, wharf, $18,000; St. George, part reconstruction of wharf, $4,000; St. John Harbor, improvements, repairs and renewals, $25,000; St. Paul (Lower Caraquet), wharf, $15,000; Seal Cove, Grand Manan Island, breakwater pier, $32,000; Shippegan Harbor, improvements at Shippegan gully, $3,500; Whitehead, Grand Manan, wharf, $5,400; Welchpool (Campobello Island), wharf, $24,000.

Maritime Provinces generally:—To purchase creosoted timber for works in the Maritime Provinces generally, $20,000.

Quebec:—Anse a Beaufils, extension of western pier and breakwater, $3,000; Anse a la Barbe breakwater, $5,000; Anse a l'Ilot landing pier, $2,500; Anse aux Gascons wharf, addition, $2,000; Cap St. Ignace, wharf, $16,500; Chicoutimi, harbor improvements, $30,000; Clarke City (Seven Islands), wharf improvements, $4,600; Doucet's Landing, pile wharf, $1,000; Douglastown pier, addition, $2,000; Escoumains, pier extension, $4,000; Father Point, wharf repairs, $1,000; Gaspe, deep water wharf, $10,000; Grande Riviere (Gaspe), repairs to wharf and roadway of approach, etc., $5,000; Grosse Isle Quarantine Station Hospital wharf, repairs to old portion of wharf, etc., $4,200; Harbors, rivers and bridges, general repairs and improvements, $48,500; Lake St. Francis (Beauce), wharfs, $5,000; Lake St. John, dredging, $5,000; Lake St. John piers, repairs, etc., $4,000; Magdalen Islands, breakwaters and piers, $10,000; Mistook wharf, Lake St. John, repairs, $1,000; New Carlisle wharf, repairs, $3,000; Port Daniel wharf, repairs, $2,500; Rimouski wharf, sheathing west side, $8,000 Riviere a la Pipe wharf, extension and repairs, $2,000; Riviere Blanche wharf, extension of headblock eastward, $7,000; Riviere Bonaventure, training pier, $9,000; Reviere du Lievre lock and dam, repairs, protection work, etc., $1,800; River Ouelle wharf, repairs and improvements, $1,000; River Richelieu, improvements, $60,000; River Saguenay, dredging and other improvements, $30,000; River St. Francis, landing pier at St. Francois du Lac on west side of river, $4,000; River St. Jacques (Laprairie), ice piers near mouth on River St. Lawrence, $1,000; River St. Maurice, channel between Grandes Piles and La Tuque, $15,500; River Yamaska, landing pier at St. Michel D'Yamaska, $4,500; St. Alphonse (de Bagotville), addition to wharf on south side, $25,000; Ste. Anne des Monts, harbor improvements at mouth of Grande Riviere Ste. Anne, $2,500; Ste. Anne du Saguenau wharf, general repairs, $2,500; St. Eloi, wharf on southwest side of River a la Loupe, $1,000; St. Francois wharf, Island of Orleans, to complete approach, $2,500; St. Fulgence, wharf, $1,000; St. Jean des Chaillons wharf, including dredging, $3,500; St. Nicholas, repairs to wharf, etc., $2,850; St. Pierre les Becquets, wharf and dredging, $7,500; St. Sulpice, wharf, $1,200; Sorel, deep water wharf, $86,000.

Ontario:—Blanche River, improvements on main stream and south branch, $6,500; Burlington Channel piers, reconstruction, $50,000; Cobourg, extension of breakwaters, dredging, etc., $60,000; Goderich harbor, repairs to piers, etc., $5,350; Harbors, rivers and bridges, general repairs and improvements, $25,000; Little Current, improvement of northern channel in Georgian Bay, $28,000; McGregor's Creek, renewal of bank protection works at Chatham, $7,100; Montreal River, improvements above Latchford, $25,000; Pelee Island western wharf, addition and improvements, $5,500; Port Stanley, groynes on east side of harbor entrance, $7,100; Port Stanley, harbor improvements, $38,000; Richard's Landing, St. Joseph's Island, repairs to pier, $1,700; River St. Lawrence, improvement of Canadian channel between Kingston and Brockville, $75,000; Rondeau Harbor, improvements, $25,000; Sault Ste. Marie wharf, dredging approaches, $55,000; Southampton, extension of and repairs to town dock, $6,000; Toronto harbor, improvements, $375,000.

Manitoba:— Harbors, rivers and bridges, general repairs and improvements, $6,000; Lake Dauphin, lowering lake by removing obstructions from bed of Mossy River, $5,000; River Assiniboine, improvements near Portage la Prairie, $1,000.

Saskatchewan and Alberta:—Harbors, rivers and bridges, general repairs and improvements, $15,000; Last Mountain Lake, improvement of navigable route, $20,000; Lesser Slave River, urgent provisional improvements, $10,000; North Saskatchewan River, removal of boulders opposite Prince Albert, $2,000.

Northwest Territories:—Harbors, rivers and bridge works, general repairs and improvements, $5,000.

British Columbia:—Columbia River, improvements, $20,000; Coquitlam, removal of obstructions, $1,500; Fraser River, improvement of ship channel and protection works, $25,000; Harbors, rivers and bridges, general repairs and improvements, $8,000; Okanagan River, improvement of navigable channel between Okanagan Lake and Dog Lake, $10,000; Skeena River, improvements, $6,000; Spallumcheen River, repairs to bank protection works at Enderby, $1,000; Williams head quarantine station, improvements, $5,000.

Yukon Territory:—Lewes and Yukon River improvements, $5,000.

Harbors and Rivers Generally:—Harbor, river and bridge works generally, $10,000.

Dredging.

Dredge repair vessels, $125,000; new dredging plant, Maritime Provinces, $100,000; new dredging plant, Ontario and Quebec, $150,000; new dredging plant, Manitoba, $14,500; new dredging plant, Saskatchewan and Alberta, $30,000; new dredging plant, British Columbia, $150,000; new dredging plant, generally, $100,000; dredging, Maritime Provinces, $230,000; dredging, Quebec and Ontario, $230,000; dredging, Manitoba, $30,000; dredging, British Columbia, $125,000; dredging, general service, $5,000.

Slides and Booms.

North Saskatchewan River, booms and log storage works, $20,000; St. Maurice district, improvement to slide and boom works, to facilitate the floating and storage of logs, etc., $30,000; Slides and booms generally, $5,000.

Roads and Bridges.

Ontario and Quebec:—Chapeau bridge over the Culbute Channel of the River Ottawa, new steel structure, supported on concrete piers and abutments, the Quebec Government to contribute $5,000, $15,000; Courtenay Bay marsh road, to provide for one-third of cost of rebuilding aboideau on road, to protect marsh and I. C. Ry. property at St. John, N.B., remaining two-thirds of cost to be contributed by Provincial Government and city of St. John, $7,000; Interprovincial bridge over Restigouche River at Metapedia, the local governments of Quebec and New Brunswick each to contribute $5,000, $20,000; Ottawa city, bridges over the River Ottawa, the slides and the Rideau Canal and approaches thereto, ordinary repairs and renewals of maintenance, $12,000.

Generally:—Dominion traffic bridges throughout Canada, including approaches, $5,000.

Telegraph Lines.

Maritime Provinces:—Meat Cove, North Sydney, Port Hawkesbury section, extension of Grand River station branch line to Victoria Bridge, Lewis Bay and Gabarus, $2,400; Mabou, Cheticamp and Meat Cove sections, branch lines from Strathlorne via Wycocomagh to Orangedale, $1,000.

Quebec:—North Shore St. Lawrence, to improve repair service, $3,000; Grosse Isle quarantine system, extension of land line on north shore of St. Lawrence from l'Ange Gardien to Laval, $2,400.

Northwest Provinces, etc.:—Edmonton, Athabaska line, extension from Athabaska Landing towards Peace River Landing, via south side of Lesser Slave Lake, $10,000.

A waterway from Montreal to New York, or the improvement of the existing waterway between these points, is being urged. In Canadian territory this would involve deepening the Richelieu River and enlarging the Chambly Canal. The locks in the canal just named are said to be 23x118 feet by 7 feet deep. The Champlain division of the Barge Canal, when completed, will provide for boats of 40-foot beam, 300-foot length and 10-foot draft. It would be necessary to improve the Hudson River navigation between Waterford and Hudson, as well as to make the Canadian improvements, in order to fully utilize the Champlain Barge Canal.

The best argument, perhaps, for getting busy promptly on the lakes to the gulf deep waterway project, says "Rock Products," an American publication, lies in the fact that the Canadian canal connecting Georgian Bay with the St. Lawrence River is likely to tap the markets of the Great Lakes with a path to the sea while we slumber and dream of the Mississippi route.

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Facts Concerning Asbestos

The sporadic use of asbestos can be traced back to ancient times, but it was not until about forty years ago that investigations were begun in Europe to develop its application on a commercial scale. About the same time specimens of fine Canadian asbestos were exhibited abroad. In 1878 fifty tons were shipped from Canada to England, and after that date the advances in the application of asbestos in commerce became rapid.

Asbestos was at first used only for spinning and weaving to make incombustible thread, yarn, rope and cloth; and this use has continued to be its most important application ever since the days of the Greeks and Romans. Of late, however, it has been widely used in the electrical arts as a basis of insulation which must withstand the rather high temperatures, and also as a fibrous binder for a great number of insulating compounds. It is also used largely in glass factories. It is practically the only fibre of a refractory nature that is at the same time an electrical insulator of high order. Further, asbestos is not affected by many of the active chemical agents likely to attack most insulators. It is also extensively used for boiler and pipe coverings, to prevent heat radiation, as well as for theatre curtains and other fireproof cloths or fabrics. Mixed with other substances it forms various incombustibles and insulating pastes and molable or solid materials suited to many different purposes. Such compounds are asbestos building lumber, century shingles, asbestos wood, asbestos slate, asbestos for stucco and plaster and asbestolith.

A mass of asbestos broken into fibres and then compressed is highly porous; yet it may be rendered not only waterproof, but an especially effective insulator under conditions of varying moisture by being saturated with certain varieties of asphalt.

As a non-conductor of heat it is used not only in the preparation of fireproof safes and vaults, but also for cold storage and cooling structures. Houses made of asbestos material or coated with asbestos throughout are not only warmer in winter, but cooler in summer.

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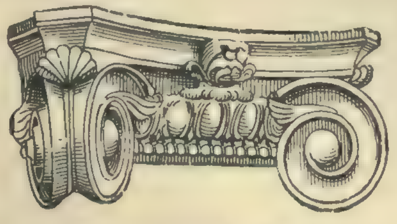

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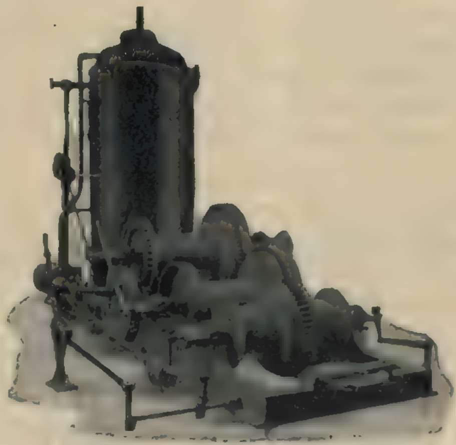

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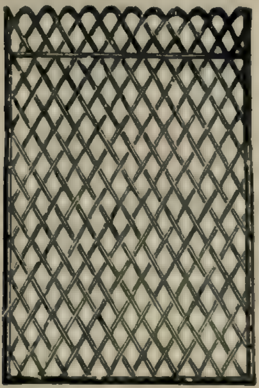

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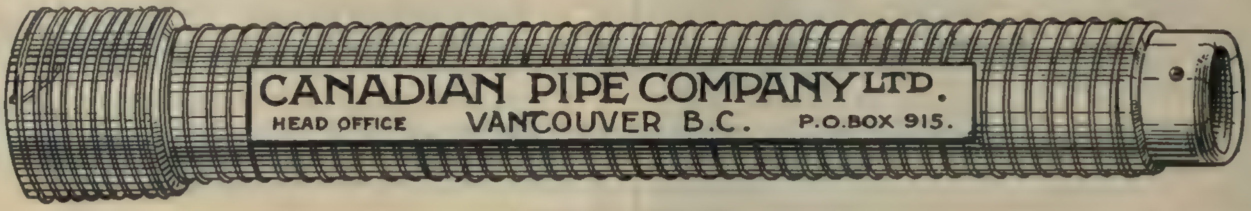
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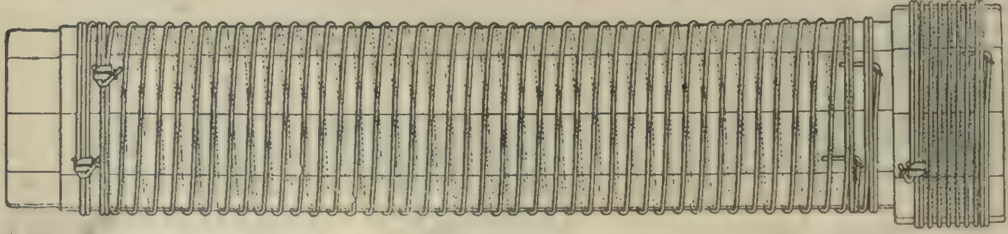

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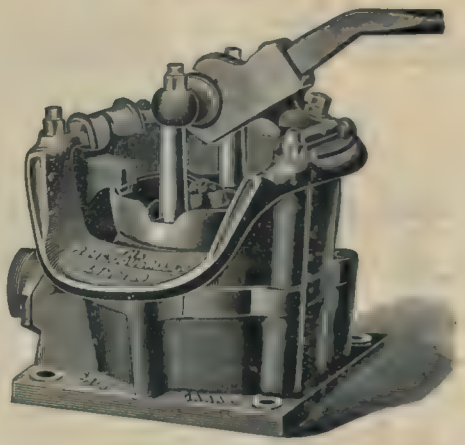

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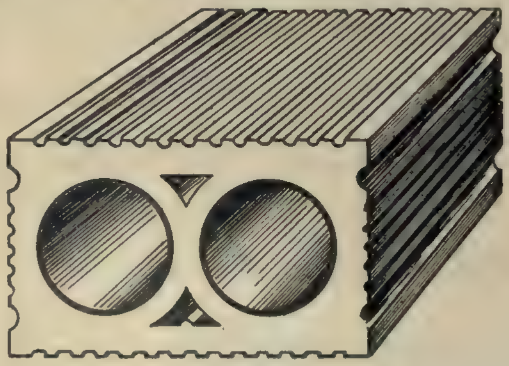

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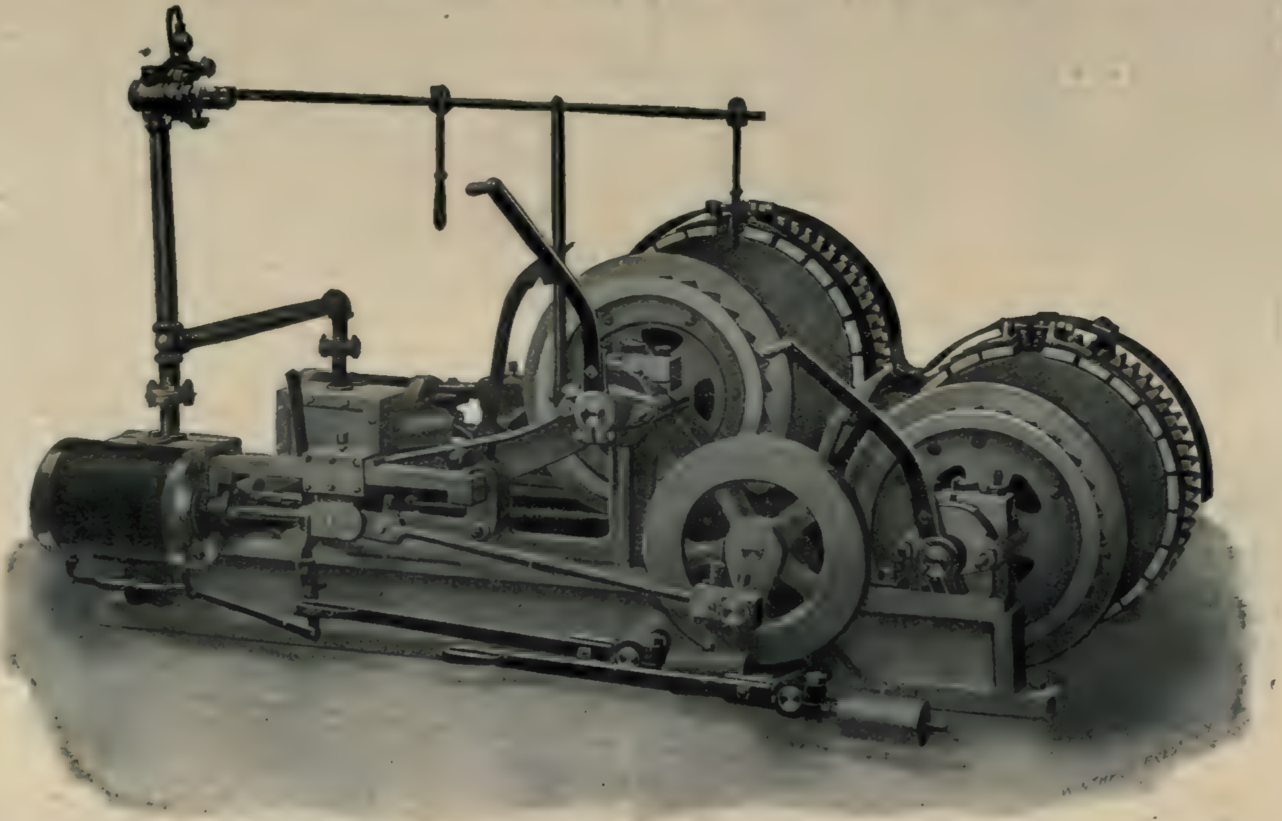

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Burlington, Ont.
Tenders addressed to O. T. Springer, Village Clerk, are invited until March 23rd for sections of the proposed waterworks system, comprising pipe laying, pump house, water tower, cast iron pipes, hydrant valves, electrically operated pumping machinery and pump well. Specifications may be seen at Mr. Springer's office at Burlington or at the office of the engineer, Willis Chipman, C.E., 103 Bay street, Toronto.

Dauphin, Man.
A deputation from this town waited upon the Government last week in reference to the formation of a new drainage district.

Edmonton, Alta.
The city will spend $120,000 this year on street paving. For this work the Bitulithic Paving Company have made an offer of $3.10 per square yard, with a five year guarantee.

Hamilton, Ont.
The Sewers Committee have appointed Chairman Jutten and Alderman Allan to procure more land for the proposed west end sewage disposal works. The Ontario Government will be asked to contribute towards establishing and maintaining the works.

Hull, Que.
A deputation from this city which included E. B. Devlin, M.P., and F. A. Gendron, M.P.P., waited upon the Premier last week to request that the operations of the Ottawa Improvement Commission be extended to Hull. They urged that a boulevard be built along the King's road through a portion of this city to Gatineau Point.

London, Ont.
Tenders are invited until March 1st for supplies required during 1909 by the Waterworks Department. These include brass fittings, hardware, hydrants, valves and valve boxes, iron castings, lead pipe, cast iron pipes, (and laying same), stopcock boxes, etc. Specifications may be obtained at the office of Moore, Henry & Munro, this city. J. H. Moore is engineer and superintendent of the Waterworks Department.

Melville, Sask.
The council are taking tenders for $6,000 debentures for grading streets and building sidewalks.

New Westminster, B.C.
Petitions are being circulated asking the Council to place a by-law before the ratepayers providing for the borrowing of over $200,000 for the construction of a water system for the district of Ladner and Delta. Preliminary plans have already been prepared by Col. Tracy, C.E., Vancouver.

Prince Albert, Sask.
Tenders are invited by C. O. Davidson, Secretary-Treasurer, until March 18th for the following road machinery: One stone crusher, one elevator and screens, one electric motor and one steam road roller. Specifications may be obtained on application to F. A. Creighton, City Engineer.

Pembroke, Ont.
At a recent meeting of the Council Mr. Sarsfield gave notice that at the next meeting he would introduce a by-law to raise by way of loan the sum of $60,000 for the purpose of laying a new 18 inch water intake pipe 4,000 feet west of O'Kelly's Point, thence 5,000 feet north to the main channel of the river.

Red Deer, Alta.
Tenders will be received by A. Stephenson, Commissioner, until March 1st for $19,400 sewer local improvement debentures, bearing six per cent. interest.

Victoria, B.C.
City Engineer Topp has recommended the following approximate amounts for street maintenance for the current year:—Cleaning, $12,000; drains, $5,000; sprinkling, $7,000; bridge repairs, $2,000; new sprinkling, $1,500; four horses and carts, $1,600; surfacing streets, $20,000; plank sidewalks maintenance, $4,300; contingencies, $3,000; moving large crusher in quarry and bunkers to different points, not including land, $2,600; total, $64,300.

Vancouver, B.C.
Tenders close February 23rd with W. McQueen, City Clerk, for supply for the current year of cement, sand, gravel and sewer pipe, also for the construction of wood block pavements on Dunsmuir and Robson street.

Wetaskiwin, Alta.
The City Council have sold the balance of the waterworks and sewerage bonds, amounting to $105,000, to the Ontario Securities Company, Limited, Toronto. The Council will now take immediate steps to complete the installation of waterworks and sewerage systems.

Winnipeg, Man.
The time for receiving tenders for supply of from 2,500 to 3,500 tons of asphalt for street paving has been extended until March 10th. M. Peterson is secretary of the Board of Control.

C. J. Brown, City Clerk, gives notice of the city's intention to carry out the construction of certain works as local improvements, including asphalt paving on Adelaide street at an estimated cost of $23,000, granolithic walk on east side of Adelaide street, from Notre Dame avenue to William avenue, at an estimated cost of $2,356, and sewer work on Heatherington avenue and Arlington street.

Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until February 25th for sewer construction in Dudley avenue and Helen street. Specifications and forms of tender may be obtained at the office of City Engineer Ruttan.

AWARDED.

Brandon, Man.
The contract for piping, valves, fittings, etc., to be used in connection with the new mechanical filters to be installed at the waterworks has been awarded to Brown & Mitchell, of Brandon, at $1,615. Thirteen tenders were received in all.

Hamilton, Ont.
The Board of Works have awarded to the Lakefield Portland Cement Company at $1.23 1-2 cents the contract for supply of cement for the current year. The price paid last year was $1.67.

The contract for laying an iron pipe down the side of the mountain, to connect sewer systems has been awarded to A. Mercer at $2,175.

Contracts for supplies to the city have been awarded, and in nearly every case the prices show a considerable slump. The secretary was instructed to figure out whether the prices quoted by the Hamilton and Toronto Sewer Pipe Company or Sackville Hill were the lower. E. J. Guest and James Marshall will divide the lime contract at $16 1-2 cents per bushel; the Hamilton Brick Company were awarded the brick contract at $8 per thousand, and the Gartshore-Thomson Company the iron castings contract at $1.95 per hundred pounds.

St. Louis, Que.
The tender of Laurin & Leitch has been accepted for supplying flagstone for sidewalks for 1909.

Winnipeg, Man.
The Board of Control have approved of a tender for 2,000 Empire water meters being awarded to the National Meter Company.

Railroads, Bridges and Wharves

Blind River, Ont.
This town is offering $17,000 to any transportation company which will construct a line of railway from Blind River to Lake Natininda, thence to Lake Chiblow, a distance of seventeen miles. John Muncaster is Secretary of Board of Trade.

Chatham, Ont.
City Engineer Bell, of St. Thomas, who has recently designed a number of bridges for the county of Elgin, has been asked by the council of Kent county to prepare an estimate for a bridge over the Thames river, twelve miles below Chatham. It will be a swing bridge of 200 feet, with a fixed span of the same distance, and will be used for general traffic.

Elora, Ont.
The C. P. R. will build a branch line, seven miles long, from Weisenburg to this place, to connect with the Credit Valley line.

Edmonton, Alta.
The C. N. R. are stated to be planning extensive additions to their shops in this city.

The G. T. P. Branch Line Company has given notice of application for legislation empowering the company to construct 325 miles of additional branch lines in Alberta. The lines to be chartered are one running south from Pembina crossing, on the main line, 100 miles to the headwaters of Little Pembina river; one running south 25 miles, from the main line along Embarras river to Macleod river, and one running 100 miles from near Calgary through Pincher Creek to the western boundary of Alberta.

Fredericton, N.B.
Plans are being prepared at the Public Works Department for new steel bridges at Chipman, Queen's county; Fredericton Junction, Sunbury county, and Buctouche, Kent county. Tenders will be asked for in the next few days.

Halifax, N.S.
The Board of Trade are considering improvements to the harbor of Port Hood.

Kincardine, Ont.
The Road and Bridge Committee is recommending the construction of permanent repairs to the Queen street bridge.

Lanigan, Sask.
The C. P. R. line from here to Prince Albert will be commenced early in the spring and pushed to completion. The gap between Wynard will be removed, thus affording two direct lines to Winnipeg.

Montreal, Que.
The C. P. R.'s programme of railway construction this year east of Fort William is stated to include a branch line from Coldwater Junction to Peterborough, which will be part of the scheme for a short rail route between Montreal and Georgian Bay ports. It is anticipated also that during the coming season forty additional miles will be added to the double-tracking of the C. P. R. between Toronto and Montreal.

Ottawa, Ont.
In reply to a question by Mr. McCarthy, Calgary, the Hon. G. P. Graham said it was not the intention of the Government to add at the present session to the obligations already incurred to aid the construction of railways. This means that the Government does not intend to introduce new railway subsidies to Parliament this year.

Peterborough, Ont.
Plans have been prepared by City Engineer Hay for the new Smith street bridge. The structure will be of steel and is estimated to cost $30,000.

Vancouver, B.C.
It is stated that the Canadian Northern Railway Company will extend its line to Vancouver. The new line will be constructed from Edmonton through the Rocky Mountains at the Yellow Head Pass down the North Thompson river in British Columbia to the intersection of Fraser river and from there through to New Westminster and Vancouver. Address T. Turnbull, Assistant Chief Engineer, Winnipeg.

Victoria, B.C.
Damage estimated at $25,000 was caused by dredging to the new dock owned by R. P. Rithet.

Application will be made to the Railway Commission to compel the G. T. P. to put in a swing bridge on the channel from Watson Island south of Kaien Island.

AWARDED.

Montreal, Que.
The Canadian Northern Railway have ordered 30,000 tons of rails from the Dominion Steel Company.

Riviere du Loup, Que.
The Smart-Turner Machine Company, Limited, Hamilton, are supplying the Intercolonial Railway Company with an outside packed plunger pump, to be installed in the shops here.

Public Buildings, Churches, Schools, etc.

Bedford, Que.
St. Damien's Roman Catholic church at this place was destroyed by fire last week at a loss of $40,000.

Brandon, Man.
Fire Commissioner Lindback has submitted to the City Council a recommendation in favor of the installation of fire alarm boxes in all schools, hospitals and other large city institutions.

Collingwood, Ont.
The Council are considering the rebuilding of the exhibition buildings recently destroyed by fire. Plans will be obtained.

Estevan, Sask.
A by-law to raise $10,000 for new municipal buildings will be submitted to the ratepayers.

Edmonton, Alta.
R. W. Lines, architect, this city, has received instructions from the School Board to prepare plans for the erection of a 16-room public school, to be built this year.

Elmwood, Man.
We are informed that the Government will not proceed this spring with the construction of the new post office.

Fernie, B.C.
The City Council have decided that tenders for the erection of the new municipal building should be called for at once. The structure is to be proceeded with immediately.

Galt, Ont.
The School Board have decided upon a six-room addition to the Central school. Plans will be secured at once.

Hargrave, Man.
The Education Department at Winnipeg is considering the establishment of a new school district at this point.

Lanigan, Sask.
The town has sold $13,000 debentures, and a town hall will be erected shortly.

London, nt.
The Catholic Board of Education will erect two new schools, one in the south-eastern section of the city and the other probably on Maitland street north, at a cost of $5,000 each.

Montreal, Que.
Tenders for the additional contracts on the new Montreal jail have been opened. That of J. B. Pauze & Company, who secured the first contract, is the lowest, at about $800,000. The architects will send in their reports without delay, and it is expected that the new contract will be awarded to Messrs. Pauze & Company in a few days.

Among the local items which have recently been passed by the Dominion Government are $20,000 for new roof and repairs to examining warehouse, $127,000 for addition to Montreal general post office, $40,000 for new postal station at Point St. Charles and $8,000 for improvements and repairs to Montreal public buildings.

Oakner, Man.
Tenders have just been taken by George Rankin, Hamiota, Man., for the erection of a Presbyterian church at this place.

Owen Sound, Ont.
The remodelling of the town hall is again under consideration and plans are being discussed for an extension involving a total cost of nearly $12,000.

Ottawa, Ont.
The Dominion Government have passed the estimate of $600,000 for the Ottawa public buildings.

At a recent meeting of the Board of Control tenders were opened for the construction of a reinforced concrete grand stand at the exhibition grounds. The tenders were called mainly for the purpose of finding out the probable cost, but are guaranteed and in due form for acceptance. Following are the tenderers:—Ottawa Construction Company, $83,868; E. A. Wallberg, Montreal, $86,950, according to one plan, $78,950 with wooden roof on steel columns; Rexford-Bishop, Limited, Montreal, $91,200 or $3,000 less if wooden roof be allowed; General Contracting Company, Toronto, $73,000 without roof, with roof of gravel, $74,200; all concrete, including roof, $81,000; Ottawa Supply Company, $94,000 or with a change in roof $90,000; Courtney & Brown, Ottawa, three prices according to design, $74,900, $78,800 and $68,600; Byers & Anglin, Montreal, $100,000; Hamilton Bridge Company, $46,000 for the steel framework alone; Morrison & Company, Montreal, three prices, $85,700, $88,500 and $84,600, according to design; International Marine Signal Company, Ottawa, $3.66 per hundred pounds for steel material, $3.97 for material and erection.

Port Arthur, Ont.
The City Council have accepted a grant of $30,000 from Andrew Carnegie for a public library.

Prince Albert, Sask.
Plans have been prepared for the erection of a new two storey school building at the corner of Fourth avenue west and Fourth street, to be erected by the Separate School Board at a cost of $8,000.

Peterborough, Ont.
At a recent meeting of the Property Committee plans for the proposed new public library were submitted by J. E. Belcher and W. Blackwell, associate architects of this city, and by McLean & Wright, Boston, Mass. The plans will be submitted to the City Council.

Quebec, Que.
Tenders for wiring the custom house in this city will be received until March 8th by N. Tessier, Secretary, Department of Public Works, Ottawa. Plans and specifications at office of P. Beland, Clerk of Works, Quebec, and at the Department at Ottawa.

Sandwich, Ont.
Fresh tenders are to be invited for the erection of Essex County Asylum, to replace that which the Home Secretary refused to sanction.

St. John, N.B.
The erection of a new drill hall in this city is now assured. A site will be acquired this season.

St. Thomas, Ont.
The Building and Grounds Committee of the Board of Education are asking the Board to place $3,218 in the estimates for repairs to the various school buildings during the current year.

Shelburne, N.S.
Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until March 1st for post office fittings at this place. Plans and specifications may be obtained on application to F. W. Muir, Clerk of Works, Shelburne, N.S., and at the Department at Ottawa.

Toronto, Ont.
Tenders are invited for all trades in the erection of a church at the corner of College and Markham streets. C. F. Wagner, 15 Toronto street, architect.

Mr. E. J. Lennox, architect, this city, has been instructed by the Building Committee of the Western Hospital to prepare plans and call for tenders for the first large section of the new hospital to be erected on Bathurst street. The cost of the new wing will be about $150,000. It will be three storeys high. Four other sections will probably be erected after this one is finished.

At the Yonge street fire hall a new $900 bell will be installed and $500 expended upon dials for the clock.

The Board of Education have appointed a committee to select a site for the new Northwest High School. The special committee have decided to recommend the addition of eight rooms and an assembly room to Riverdale High School. The cost, in addition to the money already provided for this purpose, will be $20,000. It was decided to have thirteen rooms in the new Parkdale school, and to build at first six of the thirteen at a cost of $25,000

A permit has been issued to Mr. Shea for the erection of a new theatre at the southeast corner of Victoria and Richmond streets. The new building will be of brick and steel, fireproof construction, with stone dressings. It will have a seating capacity of two thousand, and will cost approximately $260,000.

A by-law to raise $248,000 for new firehalls and police stations will be submitted to the ratepayers.

At a recent meeting of the Board of Control, the recommendation of the Property Committee to appropriate $30,000 for the improvement of the assembly hall at the city hall was rejected. Also, instead of spending $5,000 on improvements to the old St. Paul's hall, Yonge street, it was decided to spend $5,000 upon the audience room in St. Lawrence hall.

Vancouver, B.C.
President Elliot, of the Northern Pacific Railway, and L. P. Gilman, assistant to the president of the Great Northern, were at Vancouver recently with a party of officials to confer with the city authorities concerning the location of joint terminals in the east end of the city.

The Associated Charities at a recent meeting decided to raise funds for the erection of a building for convalescent patients of the hospital.

Victoria, B.C.
Tenders close February 24th with Hooper & Watkins, architects, this city, for the erection of a brick and reinforced concrete school building.

The Premier will introduce a bill this session for the appointment of a commission to select a site for the proposed university.

Winnipeg, Man.
The congregation of the Central Congregational Church are considering means to secure the enlargement of their building. Rev. J. L. Gordon is pastor.

A site is being selected for the erection of a new hall for the Knights of Columbus.

Tenders are being taken for the excavation of a theatre on Dufferin avenue. Smith & Bruce, 261 Fort street, architects.

It is stated that good progress is being made in the raising of funds for the new provincial sanitarium. Private subscriptions amount to $25,000 and municipal subscriptions to $4,500. The Government have not yet made any grants towards the building, but a favorable announcement in this regard is anticipated in the near future.

AWARDED.

St. John, N.B.
Contracts for the new Seamen's Institute have been awarded as follows: Masonry, Mooney & Son; carpentry, A. E. Hamilton; sheet metal work, J. E. Wilson; plumbing, G. & E. Blake.

Residences

Cochrane, Ont.
Tenders addressed to P. E. Ryan, Secretary, Transcontinental Railway Commission, Ottawa, will be received until March 5th for the construction of an engineer's house at this place. Plans at offices of H. D. Lumsden, Chief Engineer, Ottawa, and the District Engineer, A. D. McFarley, North Bay.

Ottawa, Ont.
The Imperial Realty Company will this summer erect a large apartment house on Laurier avenue at a cost of about $300,000. The structure will be eight storeys high and will be built of Indiana sandstone, steel and terra cotta. Plans have already been prepared by H. C. Stone, of Montreal.

Prince Albert, Sask.
Creighton & McConnell have prepared plans for an apartment block of brick construction to be erected for MacDonald & Stewart at a cost of $30,000.

Vancouver, B.C.
A. J. Bird, architect, is preparing plans for a frame apartment house to be erected at the corner of Seventh avenue and Bridge street for Mr. W. A. Clark.

Victoria, B.C.
Building permits issued last week to George C. Mesher cover buildings to cost $37,500, comprising a four storey basement block for Yates street, a twenty-roomed rooming house on McClure and Collinson streets, and a nine-roomed dwelling house to be built on land on the Gorge road. Two of the buildings, the Yates street block and the twenty-roomed rooming house, are being built for the Victoria Building Company, and the dwelling house at the Gorge road is for R. Beard. All the plans and work are in the hands of George C. Mesher, architect. Operations will be started immediately.

Toronto, Ont.
A site on the corner of Rowanwood and Cluny avenues has been purchased by Mr. Ruliff Grass for the erection of a large residence. A site on the corner of Scarth road and Rowanwood avenue has also been sold to the prospective builder of a large residence.

Recent building permits include:—C. Stevens, brick dwelling, Sunnyside avenue, $3,200; C. F. Barton, brick dwelling, Ridout street, $5,000; J. V. Moore, brick stable, Coatsworth and Reid's lanes, $4,000; Law and Milne, pair brick dwellings, Concord avenue, $4,000; R. E. Holt, 2 pair brick dwellings, Marguerettta street, $9,000; J. Gibson, 2 pair brick dwellings, Howard Park avenue, $9,000; E. Ferris, brick dwelling, Palmerston boulevard, $4,000; R. E. McDonagh, pair brick dwellings, Grace street, $4,600; John Deitch, 3 brick dwellings, Ossington avenue, $6,000; C. Hubbard, pair brick veneer dwellings, corner Lappin and Lansdowne avenue, $5,000; R. S. Coryell, brick dwelling, Roxborough street, $5,000; E. R. Rolph, brick dwelling, Jackson avenue, $7,000; E. M. Hildred, pair brick dwellings, Maple street, $8,000.

Winnipeg, Man.
City Engineer Ruttan has been instructed to secure plans for a building to house the employees at the high pressure plant.

Recent building permits include: Silas Parks, residence, Mulvey street, $2,500; K. Stefansson, residence, Agnes street, $2,000; G. F. Bergmann, two cottages, College avenue, $3,000.

AWARDED.

Argyle, N.S.
Rhodes, Curry & Company, of Amherst, N.S., have secured the contract for the erection of a bungalow at this place for Mr. Cox, of Boston. Estimated cost $30,000. The structure is for a number of families who propose making Argyle their summer headquarters.

Vancouver, B.C.
Grant & Henderson, architects, have awarded to P. S. Perry the contract for the construction of a brick rooming house on Cordova street, estimated to cost $22,000. The same firm have awarded to J. J. Dissette, at $15,000, the contract for a large rooming house on Davie and Hornby streets.

Business Buildings and Industrial Plants

Almonte, Ont.
The flour mill owned by the Wylie Milling Company, Limited, was destroyed by fire last week.

Brandon, Man.
Tenders addressed to Frank Lee, Division Engineer, Winnipeg, are receivable until March 10th for the construction of a six-stall addition to the engine house here. Plans and specifications may be seen on application to Mr. Lee.

The Union Bank have purchased a site on Eleventh and Rosser avenue for their proposed new building.

Edmonton, Alta.
H. A. Magoon, architect, has prepared plans for a store and office building of brick and stone construction to be erected on Jasper avenue by Miller, Spence & Cannell, at a cost of $30,000. Mr. Magoon has also prepared plans for a frame store and office building to be erected at the corner of First street and Peace avenue, by [illegible] Rankin, at a cost of $10,000. Tenders for the latter building are now being taken.

The buildings of A. Markham, Great West Implement Company, Palace Restaurant Company, and others, were damaged by fire last week at considerable loss.

Fernie, B.C.
Negotiations are said to be in progress for the establishment of a cement works.

Fort William, Ont.
The Algoma Steam Laundry are planning the extension of their premises.

Hull, Que.
It is stated that a Pittsburg firm of piano manufacturers are in communication

with the Board of Trade with a view to establishing a factory here.

Halifax, N.S.
It is reported that the Dominion Cold Storage Company contemplate the erection of a large modern warehouse and plant to cost between $200,000 and $300,000. Plans are stated to have already been prepared. The building will be five storeys, and will be constructed of reinforced concrete, and faced with buff brick manufactured by the Mayhew Brick Company, of England. The outside walls and partitions will be insulated with granulated cork, manufactured by the Armstrong Cork Company, of Montreal. The mechanical refrigerating plant will be installed by the Lindey British Refrigerating Company, of Canada.

Kenora, Ont.
The Tourist Hotel Company are issuing bonds to the extent of $87,000 for the completion of their new hotel, which they hope to have ready for the coming season.

Kamloops, B.C.
It is stated that several new industries are about to locate in this town. Plans have been completed for a steam laundry to be erected here at a cost of $6,000. A poultry farm will be located in this district by Mr. G. Threalfall, of Richmond, Eng., who recently arrived here. Several substantial buildings will be erected.

Lachine, Que.
The business block at the coner of St. Joseph street and Sixth avenue was destroyed by fire last week at a loss of $3,000.

London, Ont.
Plans are being prepared for a new five storey warehouse to be erected on King street for Mr. John Garvey.

Lethbridge, Alta.
The Lethbridge Brewing & Malting Company will erect a $75,000 malt house in this city during the coming summer.

New Westminster, B.C.
It is further stated that the Swift Packing Company, of Chicago, and other capitalists have purchased the Fraser river tannery in this city and that they contemplate the erection of a large saw mill or mills. The concern is stated to be planning the expenditure of $3,000,000.

Quebec, Que.
The Great Northern Railway will erect large freight sheds on St. Andrew street in the spring.

Regina, Sask.
Plans are being prepared for a large structure for the Heintzman Piano Company, to be erected near the post office.

Sturgeon Falls, Ont.
Oscar Rusk, of Cache Bay, Ont., will shortly erect a sawmill here.

South Bay, Ont.
The grist mill owned by J. Thompson was destroyed by fire last week at a loss of $3,000.

St. Catharines, Ont.
The Parry Sound Furniture Staples Company, Limited, Parry Sound, Ont., will establish a basket and box factory in this district. They are now offering for sale $30,000 of their capital stock for the purpose.

St. John, N.B.
G. E. Fairweather, architect, this city, has just taken tenders for the erection of a brick automobile garage on Prince William street for Mr. J. A. Pugsley.

Sapperton, B.C.
The Great Northern Railway are reported to be making preparations for laying out at an early date their proposed car yards at this place.

Sault Ste. Marie, Ont.
Manager Franz, of the Lake Superior Corporation, which was recently taken over by English capitalists, recently issued a statement that the company would immediately commence extensive additions to the open hearth furnaces at the Algoma Steel plant in the Canadian "Soo." Other improvements are to follow quickly, the intention being to make it the greatest steel concern in Canada. It is reported that the company will erect new blast furnaces and a structural steel plant.

Truro, N.S.
P. Archibald will probably erect a large store building on Prince street.

Toronto, Ont.
R. H. Graham will erect a pair of brick stores and dwellings on Bloor street west at a cost of $4,000.

A permit has been granted to F. A. Powell for alterations to stores on Queen street east at a cost of $8,000.

W. H. Thompson has obtained a permit to build a brick store and dwelling on Yonge street at a cost of $4,000.

W. Grogan will erect a brick store and dwelling at the corner of Howard Park and Roncesvalles avenue at a cost of $3,700.

The Bell Telephone Company have obtained a permit to erect a five storey and basement building, of skeleton steel construction, on Adelaide street at an estimated cost of $320,000. Provision is made for the addition of two storeys later on. Excavation work will be commenced immediately.

Vancouver, B.C.
Mr. C. T. Dunbar, of this city, has purchased a site on Granville street and is stated to have important plans.

The Michigan Pacific Lumber Company are stated to be planning the erection of a large mill at Harriston, 30 miles east of this city.

Plans have been completed for the large bathing pavilion to be erected at English Bay. The building will be 276 feet long. E. E. Blackmore, architect.

Tenders for the new Board of Trade building are now being received. J. S. Helyer, architect.

Welland, Ont.
Mr. B. J. McCormick, a director of the Dain Manufacturing Company, Ottumwa, Iowa, recently returned from Chicago and states that at a general meeting of the company it was decided to commence the proposed new building in Welland as soon as the frost gets out of the ground. The main building will be 60 by 350 feet, with two "L's" 60 by 150 feet, brick and concrete construction.

Winnipeg, Man.
It is stated that Oldfield, Kirby and Gardner have secured an option on the vacant property east of the post office with a view to the erection of a six or seven storey office building.

The Western Terminal Elevator Company, Winnipeg, capitalized at $500,000, have obtained a charter and are said to have important plans.

C. H. Enderton is having plans prepared for a large office and business block on Portage avenue.

The Manitoba Iron Works Company have purchased six properties adjacent to their works for the erection of a large bridge shop.

It is rumored that a Winnipeg company have purchased a site on Fourth street for the erection of a seven storey block. Mr. J. R. Higgins is stated to be the attorney of the firm.

N. J. Breen, of this city, is having plans prepared for a large apartment block to be erected this spring.

J. S. Wilbert will make alterations to his warehouse on Gordon avenue at a cost of $3,000.

Mackenzie & Mann have taken out a permit for a warehouse at the C. N. R. yards to cost $3,500.

Yorkton, Sask.
The Northern Elevator Company will this season erect elevators at Leslie, Elfros and Wynyard on the Yorkton-Lanigan extension. At Leslie and Elfros stone is already on the ground for foundation work.

AWARDED.

Vancouver, B.C.
J. J. Dissette has been awarded the contract at $15,000 for the erection of a brick store and rooming house on Davie and Hornby streets. Grant & Henderson, architects.

Parr & Fee have awarded to Peter Tardiff the contract for the new $20,000 Filion building on Carrall street.

Power Plants, Electricity and Telephones

Armstrong, B.C.
The city has decided to buy the electric lighting plant at $24,000. The power is generated at Davis Creek.

Beamsville, Ont.
This village is about to take over the electric lighting system from the company which has operated it heretofore.

Chatham, N.B.
Tenders close February 24th with R. A. Logie for the purchase of $25,000 town electric light debentures.

Grimsby, Ont.
This village is about to take over the electric lighting system from the company which has heretofore operated it.

Havelock, Ont.
The Village Council recently passed a resolution recommending the Legislature to grant a charter for the construction of an electric line between Port Hope, Cobourg and Havelock.

Hamilton, Ont.
The City Council has decided not to carry out its contract for power with the Cataract Power Company, but to submit the question again to the ratepayers.

The Wentworth, Ont., County Council object to the Hydro-Electric Commission erecting towers in the county in the way it is proposed, and a resolution has been passed unanimously to petition the Ontario Legislature to grant no privileges to the Commission to erect towers or poles on the highways of the county.

London, Ont.
The London Electric Company places the price at which it will sell out to the city at $506,000.

Plans and estimates are being prepared by Electrical Engineer Sifton in regard to Niagara power. Two estimates will be submitted, one on the cost of duplicating the present electric plant, and the other on the cost of a plant to distribute 5,000 horse-power, as outlined in his previous estimate to the committee when he named that amount as the probable sale at $35 per horse-power or less.

Moyie, B.C.

The Kootenay Telephone Lines, Limited, have recently extended their lines north to Wasa and south to Elkmouth and Waldo, and to other points near the international boundary at Gateway. They have also provided a long distance connection with the local system at Moyie. They have now obtained a charter for the construction of a local system at Fernie. This system is rapidly being pushed to completion. The company also intends to put its subscribers in long distance communication with all eastern points served by the Alberta Government system. The chief part of the company's expenditure in the near future will be in putting in a copper metallic circuit, consisting throughout of two copper wires of 10 gauge. This line will be carried on cedar poles set 165 feet apart from Crow's Nest to Port Hill, Idaho. The Alberta system will be connected with this line at Crow's Nest.

Montreal, Que.

A company has been organized to construct an elevated railway from the western limits of the city to the eastern limits of the town of Maisonneuve. Application for a charter is now being made.

New Westminster, B.C.

The British Columbia Electric Railway will soon be under way with the laying of steel for the Cloverdale branch of the new Chilliwack line. The company has let the tenders for getting out of the necessary poles to support the trolley wires. The first consignment was to be delivered on February 15. The work of raising the poles and stringing the wires will be done by the electric force of the company and will easily be completed by the time the rails are laid. Two months is the lowest estimate of time for the completion of the Cloverdale branch. The pressure of work at the car shops in the city was so great that the company found it necessary to place the order for the cars for this branch with an eastern firm.

Oshawa, Ont.

Tenders will be received until March 4th for the entire capital stock, save certain shares, of the Oshawa Electric Light Company, Limited. This company owns its own steam generating plant and water power in the town of Oshawa. This company also owns the property and assets of the Bowmanville Electric Light Company, Limited, having steam and water power generating plant and transmission system in the town of Bowmanville. Address E. R. C. Clarkson, 33 Scott street, Toronto, for full information.

Port Arthur, Ont.

At a meeting of the Electric Railway Commissioners, the secretary was authorized to call for tenders for rails, ties, bolts, etc., required to complete the double tracking of the electric railway to the Fort William boundary.

Renfrew, Ont.

At a recent meeting of the Town Council, a by-law to raise $35,000 for the purchase and development of the Hough water power was introduced and read a first time.

Sydney, N.S.

The Cape Breton County Council have agreed to grant a bonus of $2,000 and exemption from taxation to the Dominion Railway & Plaster Company, which proposes to construct an electric tramway from Sydney to Plaster Quarries at East Bay.

Toronto, Ont.

The Board of Control has decided to notify the Toronto Electric Light Company that it must not extend its system by erecting poles or stringing wires beyond the limits of the city as they existed at the time the franchise was granted. This means that the city will retain a monopoly of the lighting in the districts which have recently been annexed.

Wingham, Ont.

A proposition is being made to form a rural telephone connection through the townships adjoining this town.

Windsor, Ont.

A group of capitalists of this city are contemplating the export of a large quantity of hydro-electric power to Detroit, and other points in Michigan. The Electrical Distributing Company, which latterly secured a Dominion charter, are the parties concerned, and they are reported to be negotiating with the Ontario Government for a supply of power. The parties interested include John Davis, former mayor of Windsor, president; George M. Hendry, vice-president, and W. C. Kennedy, manager of the Windsor Gas Company, is secretary.

Winnipeg, Man.

The City Council have passed a by-law to provide for an issue of half a million pounds sterling in bonds on the London market, the money to be used for local improvements and municipal power plant.

The C. P. R. announce that the telephone system will be installed almost immediately between this city and Brandon, to supersede the telegraph for train despatching. If the experiment proves successful extensions are contemplated.

AWARDED.

McLeod, Alta.

The Northern Electric & Manufacturing Company, Limited, have been awarded the contract for a Western electric 260 kw. 2,200 volt, 60 cycle polyphase alternator and switchboard for the town.

Miscellaneous

Calgary, Alta.

Tenders will be received until March 1st for the supply of material and labor necessary for the construction of a coal and ash conveyor. H. E. Gillis is City Clerk.

Edmonton, Alta.

Tenders for spruce lumber, required by the city during the year, were recently opened by the Commissioners. The tenders were based on the amount of spruce used last year, which totalled 828,000 feet. For the different sizes the tenders were: Edmonton Lumber Company, $20.40, $21.25, $20.40, $21.25; D. R. Fraser & Company, $20, $21, $20, $21; John Walter, $20.40, $21.25, $20.40, $21.25; McInnes Lumber Company—on cars, $18.50, $19.50, $18.50, $18.50; delivered from yards, $19.50, $20,-50, $19.50, $19.50; Cushing Brothers Company, $19, $20, $21, $21; W. H. Clarke & Company, $20.40, $21.25, $20.40, $21.25; Alberta Lumber Company, $20, $21 to $23, $22, $21.50 to $23. The Commissioners recommend the acceptance of the Cushing Brothers Company, Limited tender, the McInnes Company having made certain stipulations with which the Board could not comply.

Fort Frances, Ont.

Tenders addressed to W. H. Elliott, Town Clerk, will be received until March 1st for supply of 275 cedar poles. Specifications obtainable on application.

Fort William, Ont.

Tenders addressed to H. S. Hancock, City Engineer, will be received until February 26th for supply of cement, sand, gravel or crushed rock, and reinforcing iron, for sewer construction.

Latchford, Ont.

We are informed that the contract for the construction of the proposed dam on the Montreal river has not yet been awarded. The Public Works epartment have the matter under consideration.

Moose Jaw, Sask.

Tenders are about to be taken for the sinking of a gas well to a depth of 2,500 feet. Before raising the money to cover the cost of the work, the City Council would like to receive information and estimates from reliable well-drillers. Communications should be addressed to J. D. Simpson, City Clerk, Moose Jaw.

Peterborough, Ont.

Tenders addressed to L. K. Jones, Secretary, Department of Railways and Canals, Ottawa, will be received until February 26th for the manufacture of the operating machines, anchorage fittings and pivots for the lock gates of the new locks of the Trent canal. Plans and specifications may be obtained at the office of the Superintending Engineer of the canal at Peterborough.

Squire, Ont.

Tenders will be received by Arthur Weaver until February 25th for 4,300 feet of rock elm plank, 3 inches by 16 feet long (not to be less than 8 inches wide), to be delivered at Herriman's Bridge, Sydenham river, Derby, not later than the 15th day of April, 1909.

Vancouver, B.C.

It is stated that a large hydraulic placer plant, estimated to cost $35,000, will be erected on Ruby creek in the Atlin country in the near future. Mr. John Hartman, attorney, of Seattle, is interested.

Winnipeg, Man.

City Engineer H. N. Ruttan will draw up a description of the machinery at the old Assiniboine pumping station at Armstrong's Point, and will send a circular to a number of western towns likely to want pumping machinery.

R. A. Taunton has abandoned the contract for putting down the caisson at well No. 7. The city will now do the work.

Tenders addressed to M. Peterson, Secretary, Board of Control, close February 24th for 100,000 hard brick for constructing work at well No. 7. Specifications at office of City Engineer Ruttan.

AWARDED.

Montreal, Que.

The Montreal Locomotive Works, Limited, have received from the Canadian General Development Company, Limited, of Montreal, an order for a four yard dipper dredge, having a steel hull and being 31 feet wide, 90 feet long and 8 feet deep.

Winnipeg, Man.

The McClary Manufacturing Company have obtained a contract for supplying the city with 640 street name plates.

Tenders and For Sale Department

Canadian Agents Wanted

A British firm manufacturing Tiles, Mosaics, Faience, Terra Cotta, etc., wants Canadian agents in Toronto, Winnipeg, Montreal and other large cities. Correspondence confidential. Box 140 CONTRACT RECORD, Toronto. 12

Business For Sale

An electrical contracting business in good Ontario city is offered for sale. Good local connection. Owner has another proposition in view. Address Box 141, CONTRACT RECORD, Toronto. 10

Applications Wanted

Applications will be received at the office of the undersigned and marked "Application for City Engineer" up to and including TUESDAY, THE 23RD OF MARCH, 1909, until 5 o'clock p.m.

J. H. TRUSDALE,
City Clerk.

Saskatoon, Sask., Feby. 15th, 1909, 10

Tenders for Supply of Asphalt

Sealed tenders, addressed to the Chairman Board of Control, for the supply of from 2,500 to 3,500 tons of Asphalt for street paving for the City of Winnipeg, will be received at the office of the undersigned up to 11 a.m. on WEDNESDAY, MARCH 10TH, 1909.

Specifications and forms of tender, together with conditions governing tenders as prescribed by by-law may be obtained at the office of the City Engineer, James Street, Winnipeg. The Board reserves the right to reject any or all tenders or to accept any bid which appears advantageous to the city.

M. PETERSON,
Secretary.

Board of Control Office,
Winnipeg, Feb. 3, 1909.

City of Wetaskiwin, Alberta

City Engineer Wanted

Applications will be received by the undersigned for the position of City Engineer of the City of Wetaskiwin, up to and including MARCH 15TH, 1909.

Applicants are to furnish references and state experience respecting Sewers, Waterworks, Street Paving and Concrete sidewalks.

Applicants to state salary required. Services to commence on, or about April 1ST, 1909.

E. ROBERTS,
City Clerk

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Tenders Wanted

Sealed tenders will be received by the undersigned up to NOON, MONDAY, MARCH 1ST, for General Hardware supplied as under:

Electrical, Rope, Twine and Chains, Paint, etc., Iron, Steel, etc.. General Hardware, Tools, Lead Pipe and Brass, Miscellaneous, Grey Iron Castings, Bolts, Nuts, Washers, Nails and Screws, Brick and Clay, Gas Pipe and Fittings, Pump Packing, Hose and Rubber Goods, Horse Shoe Material, Coal and Coke, Oil, Waste, etc., Lamps and Lanterns.

Specifications and bills of quantities can be had at the Office of the City Comptroller.

Thelowest or any tender not necessarily accepted.

CITY COMMISSIONERS.

City Hall, Calgary, February 2nd, 1909. 8

TENDER

Tenders will be received up to noon, MARCH 1ST, 1909, by the City Commissioners addressed to the undersigned for the supply of material and labor necessary for the construction of a

Coal and Ash Conveyor

for the City of Calgary.

Plans and specifications can be obtained at the City Engineer's Office.

The lowest or any tender not necessarily accepted.

H. E. GILLIS,
City Clerk.

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Village of Burlington

Province of Ontario

WATER WORKS

Tenders Wanted

Sealed tenders will be received by the Village Clerk until

8 p.m. on Tuesday, March 23, 1909,

for the following sections of the proposed Water Works System:

- **"A" Pipelaying.**
- **"B" Pump House.**
- **"C" Water Tower.**
- **"D" Cast Iron Pipes.**
- **"E" Hydrant Valves.**
- **"G" Electrically Operated Pumping Machinery.**
- **"I" Pump Well.**

Plans and specifications for "A", "C", "D" and "E" may be seen at the office of the Clerk, Burlington, or at the office of the Chief Engineer, Toronto, on or after March 1st.

M. C. SMITH, Esq.,
Reeve,
Burlington, Ont.

O. T. SPRINGER, Esq.,
Clerk,
Burlington, Ont.

WILLIS CHIPMAN, C.E., Chief Engineer,
103 Bay St., Toronto, Ont.

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Department of Railways and Canals, Canada

Trent Canal

Notice to Contractors

Machinery and Fittings

Sealed Tenders addressed to Alexander J. Grant, Superintending Engineer, Trent Canal, Peterboro, and endorsed "Tender for Operating Machines" will be received until 16 o'clock on FRIDAY, THE 26TH FEBRUARY, 1909, for the manufacture, etc., of the "Operating Machines," "Anchorage Fittings" and "Pivots," for the Lock Gates of the new Locks of the Trent Canal.

Plans and Specifications can be seen, and Forms of Tender obtained on and after this date at the office of the Superintending Engineer of the Canal at Peterboro.

The lowest or any tender not necessarily accepted.

By Order,
L. K. JONES,
Secretary.

Department of Railways and Canals,
Ottawa, 18th February, 1909.

Newspapers inserting this advertisement without authority from the Department wiil not be paid for it.

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City of Prince Albert

Tenders

"Tenders for Road Machinery" will be received unti 8 p.m. on THURSDAY, MARCH 18TH, for the following:

1. 1 Stone Crusher.
2. 1 Elevator and Screens.
3. 1 Electric Motor.
4. 1 Steam Road Roller.

Specifications and other information will be forwarded on application to F. A. Creighton, Esq., City Engineer, Prince Albert, Sask.

C. O. DAVIDSON
Secretary-Treasurer

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Notes

F. R. J. MacPherson & Company, plumbers, etc., Peterborough, Ont., have been succeeded by the F. R. J. MacPherson Company, Limited.

Mr. A. McCallum has been appointed City Engineer of Hamilton at a salary of $3,500 a year, and will enter upon his duties on May 1st. City Engineer Barrow will be retained for the present as Consulting Engineer at a salary of $2,200.

J. A. Dawson & Company, electrical supplies, Montreal, have been incorporated under the name of Dawson & Company, Limited. Among the orders recently secured is one from the Winnipeg Street Railway Company for heaters and trucks for thirty cars, also vestibule heaters for thirty additional cars.

Applications will be received until March 15th for the position of city engineer of Wetaskiwin, Alta. Applicants are asked to state salary required, to furnish references, and to state experience in regard to sewers, waterworks, street paving and concrete sidewalks. Services to commence on or about April 1st. Address E. Roberts, City Clerk, Wetaskiwin, Alta, for further information.

An interesting and well attended exhibition of builders' supplies and hardware was held at the Waldorf hotel, Hamilton, last week. The management gave space on the first, second and third floors to the following firms and their respective lines: Canada Wire Goods Manufacturing Company, Hamilton, all kinds of steel and iron jail work, entrance doors, steel wire guards, jail bunks, etc., plain wrought iron gates, wire binding for reinforcing concrete, sand and gravel screens, bank and office railings; Hamilton & Toronto Sewer Pipe Company, Limited, Hamilton, square and oval flues, terra cotta chimney tops and sewer pipe; Allith Manufacturing Company, Limited, Hamilton, door hangers, track and automatic fixtures; Taylor-Forbes Company, Limited, Guelph, Ont., hardware specialities and woodenware; F. W. Bird & Son, Hamilton, Ont., Paroid roofing. (This firm have recently supplied 770,000 square feet of their roofing to Messina, Italy.) Canadian Hart Wheels, Limited, Hamilton, power grinders; Pittsburgh Wire Fence Company, Pittsburgh and Canada fencing; E. C. Atkins & Company, Hamilton and Indianapolis, belt and strap punches, vest saws for cutting nails; S. F. Bowser & Company, Toronto, oil storage tanks.

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The Cement and Concrete Convention

The first annual convention and exhibition of the Canadian Cement and Concrete Association, the programme of which is published elsewhere in this issue, will be an event of much importance to the building trades and professions in Canada. The undertaking indicates in the first place that the new association is one which will make its influence strongly felt. It is as yet only in its infancy, having come into existence on April 20, 1908. It is therefore still under a year old, yet it is venturing upon the stormy seas of conventions and exhibitions without fear, and from the enthusiastic and business-like manner in which the matter has been taken up, the success of the undertaking is already assured. The association is to be sincerely congratulated upon the programme which it has prepared. This includes addresses by practical and eminent men who will give the delegates the benefit of their wide experience on the varying branches of cement and concrete engineering and business. The delegates will have the advantage of seeing with their own eyes at the exhibition, and hearing with their own ears at the convention, the latest developments which are of material interest to them in their work. In this manner they will be able to obtain information which would take them months to acquire otherwise, and will come into touch with others of their profession and business when they could not otherwise meet. There is no gainsaying the fact therefore that those who attend will be more than repaid for their time and expense.

Conventions have been growing more frequent of late in every branch of business activity and have been found to be one of the best methods available for promoting the mutual interests and advancing the knowledge of those concerned. There is, however, a further value in such a convention as this. It will increase the interest and the information of the general public and in this way business interests will be much benefitted. It is incumbent, therefore, upon all who make a living out of cement or concrete, that they should encourage this association It has commenced its life in a vigorous manner and will be an all-important factor in their business life in the future. It is above all things an eminently practical association and is already recognized as one of the leading influences in its field. In the United States the convention movement has been adopted by the cement and concrete interests all over the country. Conventions which have recently been held have attracted widespread attention, and it is not stretching the point to say that they had much to do in assisting the cement and concrete interests, generally, to overcome the serious business depression which overtook industry in general during the year 1908.

One may, with reason, look forward to an increased field of usefulness for the Canadian Cement and Concrete Association. It has started as a Dominion Association and it could well devote its attention in the near future to fostering its interests throughout Canada. It will encourage those who attend to institute exhibitions and conventions in other parts of Canada and thus do a great deal towards increasing the use of cement and concrete. The association is on the right track and with the momentum obtained from this exhibition and convention it should be able to achieve large results. Its members, and the delegates who give the benefit of their knowledge to others in their addresses, are doing a commendable work for a great industry and are deserving of every encouragement.

The Handling of a Building Prospect

The man who is "thinking of building" is not always an easy man to approach, as every builder knows. In getting out for new business there are three essentials: Courtesy, cheerfulness, and tact. The first is an introduction and engenders respect; the second lends encouragement, and the third, when used in conjunction with the other two, is that which secures the signature to the contract. While these are what might be termed essential points, there are other matters to be borne in mind. The building prospect, like every other sensible man who is going to put his hand into his pocket, has his idiosyncrasies, and it is a valuable asset to know what these are before attempting to open up negotiations. A few suggestions parallel with his line of thought will gratify him, especially if those suggestions come from a good, practical man with a reputation for thoroughness and square dealing.

In any case, however, disappointment awaits the man who expects, confidently, to secure the job at the first asking. Confidence is all very well, but a man should not bank on it alone at the outset. Tenacity, the ability to "keep pegging away," is one of the secrets of successfully working up a greater business and to the lack of it, on the part of many a good builder, may be assigned the reason for the postponed erection of many a neat little suburban villa or city warehouse. He who succeeds is the man who is so confident of the ultimate issue that, emulating the bulldog, he "never lets go." Nothing so disheartens some men as to be refused on their first effort. They are at once ready to give up and talk "hard times" to any stray pessimist they may find. Countless numbers of such men were in evidence during the recent depression. These people should be avoided. They are of the wrong calibre and their influence is not wholesome. Optimism, tenacity, tact, square dealing: these are synonymous with success.

Practical Ideas for Building Foundations

A Consideration of the Merits and Demerits of Various Soils, by H. Gilbert Bryan, Architect

Every building settles more or less, and precautions should be taken to secure uniformity of settlement. The principles to be observed are to distribute the weight of the structure over a large area of bearing surface, and to prevent any escape of the supporting material laterally. The pressure should be distributed equally over the soil by the foundations. Thus the foundations should vary in width according to the height of the superincumbent wall and load on that part of the building. Of course it will be understood that the nature of the ground varies considerably in different parts of the country, sometimes in different parts of the same city, and, even, in some cases, in different streets or gardens. Therefore, in dealing with the following different kinds of ground, it must be understood that the remarks are made in a general sense, and are not intended to lay down any hard and fast rule, as in all cases personal inspection and common sense are necessary before deciding any points regarding foundation work.

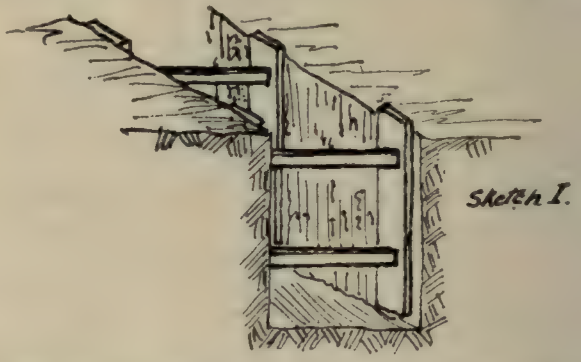
A good foundation should be in "solid," as opposed to "made up" ground; it should be incompressible, and of the same nature throughout, the strata being at right angles to the weight they have to carry, i.e., horizontal, instead of dipping or sloping. When panned with a rammer it should sound "solid," a hollow sound indicating an inferior nature below, and it should resist the pick or crowbar well driven in, without disintegration of the surrounding mass.

All foundations, of whatever kind, should be perfectly level (except where they are "stepped") before they receive the concrete or footings, ground of a strong or rocky nature being levelled with a pick, and the softer kinds well rammed. The solid ground should always be reached; and if there are great variations, etc., arches should be thrown over weak places, when at a great depth, from piers built on the solid. If a solid stratum be reached, with an inferior one below, it is unadvisable, to go any deeper, if that solid stratum is sufficiently strong to carry the weight required. Where the nature of the ground will not allow of the building being built on it with safety, concrete of specified and adequate depth and strength is employed in the trench to assist the natural ground by distributing the weight.

Solid rock generally provides a good foundation that cannot be bettered, particularly when the stratum is more or less level, so that it would be ridiculous to take it out merely to replace it by an inferior article such as concrete. However, the bottom should be made truly level; or, if it is uneven by nature, the loose inferior portions should be taken out of those places, arched over to and from the solid, and concrete should be put in. If the ground is sloping, the surface may be stepped. Foundations on solid rock should be built with caution, as the advantages are not so real as they appear, for the labor in obtaining a level bed is generally very considerable and, unless the strata is nearly level, in a large building parts will rest on the rock and others on another stratum, such as gravel or clay, resulting in irregularity of settlement. This is a frequent occurrence.

Granite, metamorphic, trap rocks and slates, usually sloping, are healthy. When, however, they have begun to disintegrate or decompose, thfey pass into a sort of loam, occasionally becoming permeated with fungus and consequently not healthy for foundations. Limestones and hard calcareouis rocks, when overlaid by marshy or water-logged soil, are supposed to be healthy, and the ground water level in such places varies with the rainfall of the district, so that in a dry season of the year that which may be apparently a dry site, may become waterlogged for months together.

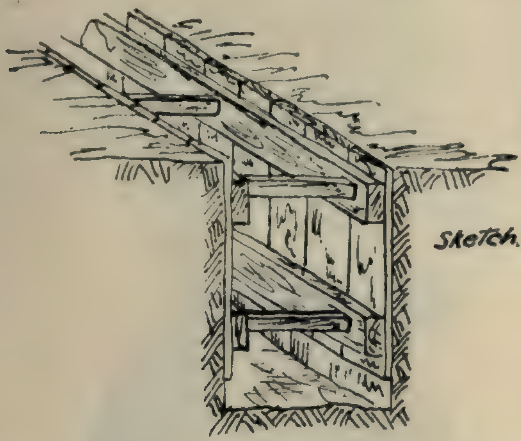
Sandstones, sand and gravel, when not low lying or waterlogged, are invariably healthy, but clays, loam, dense marls and alluvial soils are damp in their nature owing to their ready absorption of moisture. Gravel forms a good foundation, being easily levelled and not easily affected by the weather. Foundations of loose gravel, however, are apt to slip and consequently when the trenches are being dug the sides must be shored by one or other of the following methods: In tolerably good ground poling boards, in size about 2 x 10 inches, are placed at intervals in pairs on each side of the trench, and strutted apart by 4 x 4-inch stout members, as in sketch 1. Where the ground is looser the poling boards must be placed close together, perpendicularly, with walings, which are placed horizontally inside them, and strutted from one to the other at intervals from 2 feet 6 inches to 4 feet, as in sketch 2. The poling boards in this case vary from 2 inches thick and the walings being usually 10 x 3 inches.



Sand is moderately good for foundations if dry, and if not liable to escape laterally or to be washed away by water. In running sand it is obvious that it is impossible to wait until a sufficient depth has been dug out to allow of vertical poling boards being used without the sides previously slipping in; wherefore sheeting, as shown in sketch 3, is used, laid longitudinally and secured by poling boards and strutted as in sketch 1. Sand, however, and especially quicksand, is treacherous, having no power to keep itself together, as it were, so that it must not be taken into any account. The best course is to remove it by excavation, if practicable, and replace it with a layer of concrete.

When such sand and other boggy and soft soils are present, and of considerable depth, so that the bottom thereof cannot be reached without too much trouble and expense for their removal, as ought to be done, a grill or skeleton platform of oak or elm is laid over the whole side and the spaces between being filled in with concrete. Over the whole site a layer or 4-inch elm planking, or 12 inches of reinforced concrete, may be substituted for this planking. Allowance must be made for the stage sinking, often a considerable depth, until it attains a bearing; and, if possible, the foundations should be weighted to the full weight of the superstructure before the latter is commenced, in order to avoid movement after completion.

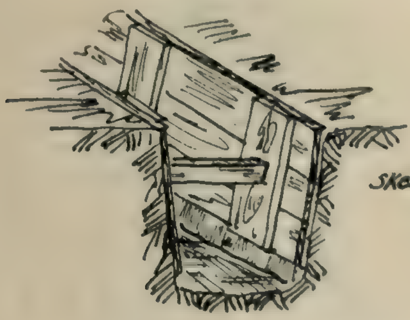
Gravel or sand foundations, when overlying clay on a slope, require to have a large drain therein, next that side of the building which adjoins the highest ground, in order to intercept the flow of water to the building. Clay when hard and dry is usually satisfactory; if damp and on a slope it is likely to prove treacherous, but the footings should be carried down to a sufficient depth so as not to be affected by the extreme weather, as clay expands and contracts when subjected to extreme temperatures.



Sketch. 2.

Made ground is never to be trusted, even though many years may have passed since its formation. If, however, it is necessary to build on it, the walls should have an extra course of footings, with cement concrete under them, not less than five times the thickness of the wall in width, and with a depth at least equal to thickness of wall.

Proper drainage and protection from water is of very great value in connection with the strength and durability of any foundation or structure, and this is particularly so in soft soils. On the other hand, water is often the main support of a building and to drain it away is then a grave error. The causes of settlement and cracking in old buildings may be attributed to the drainage of soil. New sewers are a frequent cause of settlement, for when the ground of the district is of a boggy nature, the thorough drainage causes it to shrink. Again, the sinking of wells in the neighborhood of sandy or loose ground subsoils is an even more serious cause of trouble.



Sketch. 3.

Uniformity of foundation and resistance to compression is of the utmost importance for the purpose of securing the requisite stability, and great care should therefore be bestowed upon the examination of the trenches. All soft places should be excavated and filled in with concrete. A soft pocket of considerable size, occurring in an otherwise good foundation, can sometimes be overcome by bridging the span with a concrete lintol or a brick arch.

The permissible load allowed on different soils is given in the by-laws prepared by the municipal authorities and must be adhered to when buildings are erected within city or town limits, but for ordinary purposes it can be taken that the following figures will suffice:

Rock, hardest, in native bed	100	tons	per sq. ft
Clay, dry, in thick beds	4-6	"	"
Clay, moderately dry, in thick beds	2-4	"	"
Clay, soft	1-2	"	"
Gravel and coarse sand well cemented	8-10	"	"
Sand, compact and well cemented	4-6	"	"
Sand, clean, dry	2-4	"	"
Quicksand, alluvial soils, etc.	½-1	"	"

Personal Mention

Mr. A. C. Hope has been appointed permanent architect for school purposes to the City Council of Vancouver, at a salary of $2,500 a year.

Mr. John Coulter, Brantford, has been appointed general manager of the Ontario Portland Cement Company, in place of the late Mr. W. G. Elliott.

Mr. Arthur Knight, formerly superintendent of the foundry of the Manitoba Iron Works, Winnipeg, has taken charge of the foundry of the Canadian Northern Railway Company in that city.

Mr. J. C. Houck, formerly superintendent of the foundry of the Forbes Malleable Iron Works, Rockford, Ill., has accepted a position as superintendent of the Valleyfield Iron Works, Montreal.

Mr. John J. Gartshore, dealer in railway equipment, Toronto, recently removed to more commodious offices at 58 Front street west, but still retains his storehouses and yard at his former address opposite the Queen's Hotel.

The board of the Ontario Securities Company, Toronto, has been strengthened by the addition of Messrs. W. K. George and E. B. Ryckman. The former gentleman is a prominent member of the business community of the city. He is the president of the Standard Silver Company, and was formerly president of the Canadian Manufacturers' Association and of the Toronto National Exhibition, from which position he has recently retired. Mr. Ryckman is a member of the legal firm of Ryckman, Kerr & MacInnes, of Toronto.

Mr. John D. Watson, of Birmingham, England, the engineer engaged by the city to report upon the proposed system of sewage disposal, has cabled City Engineer Rust that he will arrive in Toronto about the 20th of the month.

Mr A Chamberlain has been placed in charge of the Belleville Portland Cement Company's new Toronto office, 24 Yonge street Arcade.

In a house in Riverside Drive, New York City, there is one noise proof room. It is hewn out of solid rock under the house, and its roof and entrances are so arranged that no noise can reach the occupants. The room was built to gratify the owner's love of quiet while playing chess. Every week leading players of the city meet there. It is said that hardly the sound of the heaviest thunder reaches the ears of the occupants of this silent room.

Everything Ready for the Cement Convention

Comprehensive Programme Prepared for Meeting at Toronto — Interesting Convention Addresses

The arrangements for the first annual convention and exhibition of the Canadian Cement and Concrete Association, which will be held at the St. Lawrence Arena, King street east, Toronto, during next week have progressed so satisfactorily that there is now every assurance of their being not only a decided success, but the forerunner of a series of similar conventions and exhibitions, which will prove of increasing importance to the building trades and professions in Canada. A large list of exhibitors has already been obtained and it is now certain that there will be a comprehensive display of everything pertaining to cement and concrete, as well as many other building materials. The exhibit is not to be confined to concrete and cement, but will include other classes of building materials. Among the exhibits there will be many varieties of builders' supplies, roofing supplies, and machinery of numerous descriptions for the manufacture of cement and other building products. The arrangements for the exhibits are being carried out upon a plan which will render them very effective.

In addition to the exhibition at the St. Lawrence Arena there will be a convention at the King Edward Hotel during which a number of interesting addresses will be delivered by well known experts in their various lines. A number of the most prominent men in Canada and the United States have undertaken to deliver addresses and these will render the convention of great advantage to those who attend. Civic officials will find much to interest them in the papers dealing with the use of cement and concrete in municipal engineering.

The convention will be opened in the banquet hall of the King Edward Hotel on the afternoon of Tuesday, March 2nd, and will continue until Friday evening. The exhibition will be officially opened on Monday evening, March 1st, and will continue throughout the week.

The Programme.

The programme for the exhibition and the convention is as follows:

Monday, March 1.

7.30 p.m.—Formal opening of the exhibition in St. Lawrence Arena, by Hon. Dr. Reaume, Minister of Public Works for Ontario. The evening will be reserved for the special reception of the citizens of Toronto by the officers and members of the association.

Tuesday, March 2.

10.30 a.m.—Meeting of Executive Board of the association at the King Edward Hotel.

2.30 p.m.—Address, Dr. John Galbraith, dean of the faculty of applied science and engineering, University of Toronto.

Annual address by the president, Mr. P. Gillespie, lecturer in theory of construction, faculty of applied science and engineering, University of Toronto.

"Why Sidewalks Fail," William M. Kinney, assistant inspecting engineer, Universal Portland Cement Company, Chicago, Ill.

8.30 p.m.—Tests and inspection of cement, J. E. Moore, inspecting engineer, Robt. W. Hunt & Company, Chicago, Ill.

"Concrete Bridges," Frank Barber, engineer county of York.

"Concrete Blocks," J. Augustine Smith, Ideal Concrete Machinery Company, South Bend, Ind.

"Portland Cement Mortars," A. G. Larsson, chemist, Grey & Bruce Portland Cement Company, Owen Sound, Ont.

Wednesday, March 3.

11.15 a.m.—Annual general meeting of members for the reception of the report of the Executive Board, and the election of officers.

2.30 p.m.—"Designing and Testing of Reinforced Concrete Beams," E. Brown, associate professor of applied mechanics, McGill University, Montreal, Que.

"Twenty Years Experience in Cement Walk Building," O. W. Cadwell, manager Cadwell Silex Stone Company, Windsor, Ont.

Mr. Peter Gillespie, President.

"Modern Methods of Waterproof Concrete," Lucius E. Allen, Ontarion Limestone & Clay Company, Belleville, Ont.

"Reinforced Concrete Design from the Standpoint of Practical Engineering," A. W. Burge, Trussed Concrete Steel Company, Toronto.

8 p.m.—"Field-made Concrete," Walter J. Francis, consulting engineer, Montreal.

"The Use of Cement in Municipal Work," A. W. Campbell, Deputy Minister of Public Works, Province

"Reinforced Concrete in Building Construction,"

of Ontario.

Emile G. Perrott, architect, Philadelphia, Pa.

"Ornamental Concrete Stone," Fred A. Norris, consulting engineer, Boston, Mass.

Thursday, March 4.

2.30 p.m.—"Factory-made Concrete Building Products," Chas. D. Watson, consulting engineer, Cleveland, Ohio.

"Electrical Equipment for Cement Plants," D. M. McCargar, late electrical engineer, Belleville Portland Cement Company, Belleville, Ont.

"Artistic Concrete Bridges," C. R. Young, lecturer in applied mechanics, University of Toronto.

Address by Mr. Merrill Watson, general sales manager, Consolidated Expanded Metal Companies, New York.

Mr. C. F. Pulfer, Vice-President.

Thursday evening will be devoted to social entertainment.

Friday, March 5.

8 p.m.—"Factory-made Concrete," M. Morssen, consulting engineer, Montreal, Que.

"Municipal Engineering," Mr. Blanchard, sewers engineer, City Hall, Toronto.

"Selection of Concrete Materials," Sanford E. Thompson, consulting engineer, Newton Highlands, Mass.

Other Arrangements.

In addition to the above papers it is expected that there will be several addresses by representatives of other bodies who have ben invited to attend and to deliver addresses. Among these are: G. W. Gouinlock, president of the Ontario Association of Architects; A. B. Barry, president of the Engineers' Club, of Toronto; C. H. Mitchell, chairman of the Toronto branch of the Canadian Society of Civil Engineers; A. F. Dunlop, R.C.A., Montreal, president of the Architectural Institue of Canada; Eden Smith, president of the Toronto Architectural Club; John Ewan, president of the Toronto Guild of Civic Art; Arthur Dinnis, president of the Toronto Builders' Exchange, and W. L. Purvis, Toronto, president of the Concrete Paving Association.

Councillor Gustave Kahn.

Special arrangements have been made with the Eastern Canada Passenger Association for reduced fares to delegates attending the convention. Delegates upon purchasing tickets to Toronto should obtain a receipt on a standard form for the money paid. This will be validated by the secretary of the association and will entitle the holder to a return fare on payment of 25 cents. The entrance fee to the exhibition will be 25 cents.

The officers of the Canadian Cement and Concrete Association are as follows: President, Peter Gillespie, lecturer in theory of construction, University of Toronto; Vice-President, C. F. Pulfer, secretary Ideal Concrete Machinery Company, London, Ont.; Secretary-Treasurer, A. E. Uren, editor "Canadian Cement and Concrete Review," Toronto; Councillors, T. L. Dates, manager Sun Portland Cement Company, Owen Sound, Ont.; Gustave Kahn, general sales manager Trussed Concrete Steel Company, Toronto; J. M. Kilbourn, treasurer Lakefield Portland Cement Company, Montreal; J. G. Murphy, president Excelsior Construction & Paving Company, Toronto; R. A. Rogers, reinforced concrete contractor, Toronto; Kennedy Stinson, manager Stinson-Reeb Builders' Supply, Montreal; C. H. Thompson, president Canadian Art Stone Company, Toronto, Ont.; R. M. Jaffray, manager of the exhibition.

Councillor T. L. Dates.

The Industrial Publication Company, New York, have published a short treatise entitled "Practical Concrete Block Making," by Chas. Palliser. The author avoids chemical and engineering formulæ, and gives reliable information in simple language so that the workman thoroughly understands every step necessary to make good substantial concrete blocks. The book will be found especially valuable to the man starting in this line of work as the hints and suggestions it contains tell how to avoid faulty work and save many dollars. Price, 50 cents.

Clay Products a Solution of Timber Scarcity

A Discussion of Their Advantages as Building Material by Professor Baker.

With the agitation of the last five years for more protection for our forests, and even for the reforestation of those parts of our cleared lands not suitable for agricultural purposes, we are brought face to face with the fact that our supplies of building timber are rapidly disappearing, and little provision is being made to supply a substitute.

The demand for timber, however, is not likely to continue so great in the future as we might think. Till very recently, timber in various forms was the chief structural material of all buildings, but hereafter it will play a less important role. Land values, in even our smaller towns, are now so high that building space must be got by erecting higher structures rather than lower ones covering a greater area. For this purpose we require materials, not only of greater durability and strength than is possessed by timber, but to be fireproof as well. Such conditions are best met by the use of steel with stone, cement, or clay products of some form. Stone is much too expensive, and cement much too heavy, to form a great part of many buildings—for example, the floors, ceilings, arches, domes, partitions, etc.—so a lighter and cheaper material must be sought.

The foundations of almost all larger buildings in America, as well as in Europe, are now built of stone or concrete. The superstructure is either steel bridgework or reinforced concrete, which is a combination of cement with steel or iron, acting as a binder to tie all together. The uprights, girders, joists, plates, etc., are so built as to carry all the load, and some light, fireproof, cheap yet strong material, is used to fill in the spaces between the more substantial structures. In many parts of Europe, such material is supplied in the deposits of silicious cinter found in volcanic districts, where hot ascending waters have carried silica to the surface, and there, on relief of pressure, have deposited the silica as a porous tuff-like bed, which can be sawed or cut into blocks of desired shape, and used as a filler. In Canada we have no such supply of suitable material, and must therefore make artificially what we fail to find in nature. A much lighter, stronger, and just as durable material can be easily made from clay, and of this Canada has an endless supply.

About the time of man's appearance in Europe, and before his birth in America, both continents were possessed of very cold climates; so much so that the northern parts of both hemispheres were visited by continental glaciers. The effects of these can be easily seen everywhere about us to-day. The glacier that passed over Ontario had its centre in the great Labrador district east of Hudson's Bay. In its southerly movement, it not only carried away any deposits of blue clay, the results of rock decomposition, that existed at that time, but wore off to an uncertain depth the very rocks themselves. (See fig. 1.) These mixed accumulations of clay, sand, gravel, etc., that we find covering all our rock surfaces (see fig. 2) are the results of that glacial action, and we wonder that there is any close relationship amongst our clays at all.

The clay industry has been somewhat ignored by scientific men, in favor of other mineral industries that appeal more readily to man's imagination, or cupidity. It may therefore surprise many of our readers to learn that in Ontario to-day, including cement, clay products comprise one-fourth of the value of the total mineral output. In the United States they form nearly one-tenth of the enormous mineral production of that country. The percentage is even higher in the various countries of Europe.

The manufacture of clay products is probably the oldest industry on earth, but new developments are constantly being made nevertheless. One of the most reecnt of these is the manufacture of "clay-lumber" or "terra cotta lumber," as it is often called. The name lumber is very aptly chosen, because it is so made, that nails, screws, bolts, etc., con be driven into it with ease, and it may therefore be put to many of the uses to which timber is now suited.

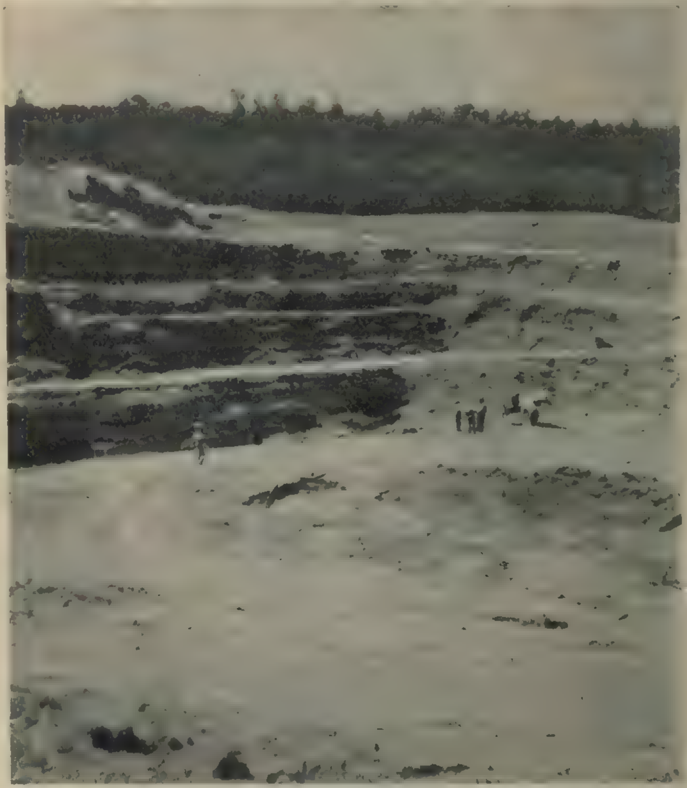


Fig. 1.—Bank of Medina shale worked by Toronto Pressed Brick Works, Milton, Ont. Note Irregular Overburden of Glacial Clay.

Clay is a substance with which everyone is quite familiar, but one of its chief properties, viz., its fusibility, may not be so well known. When clay is heated to a temperature of about 1800 degrees, it begins to fuse and the particles weld or knit together, and the clinker when cooled assumes a hard rock-like consistency. In the manufacture of clay-lumber, the raw clay is mixed with some combustible substance, usually sawdust, and sufficient water to make a stiff mud. This mixture is then put through an auger machine, which consists of a hollow steel barrel about the shape of a cannon, within which an auger is turning, thus constantly forcing the clay towards the muzzle of the machine. Dies of any desired shape are bolted onto the muzzle of the machine, and as the clay is forced out, it must of necessity take the shape desired. The clay issues as a long column which can be cut off into blocks of proper size by means of fine wires set on a frame (see fig. 3). By changing the dies to suit the architect's plans, any shape of block may be made suitable for domes, arches, ceilings, cornice, partitions, roofing, etc. When the goods have sufficiently dried to be handled (se fig. 4), they are placed in a kiln, and the sawdust or other combustible, mixed with the clay, will burn out, thus helping to distribute the heat, and at the same time producing a light, porous, and fireproof block.

Fig. 2.—Bank of Erie Blue Clay 120 Feet Deep, in West Bank Maitland River, Goderich*

For walls and partitions this clay-lumber is made in the form of hollow blocks, which have many other advantages besides being light in weight. The air space within the blocks acts the same as the air space between our double windows in winter. Air is a poor conductor of heat, and these blocks therefore keep a building warmer in winter, by preventing the loss of heat; and cooler in summer by preventing the entrance of it. Moreover, this air space makes a much quieter building by deafening the noise from surroundings. Another great advantage is that, owing to the porous character of the blocks, one can plaster and finish the walls and ceilings without first lathing them; but if one wishes to finish with lumber of any particular kind, he can nail into this clay-lumber almost as easily as into timber.

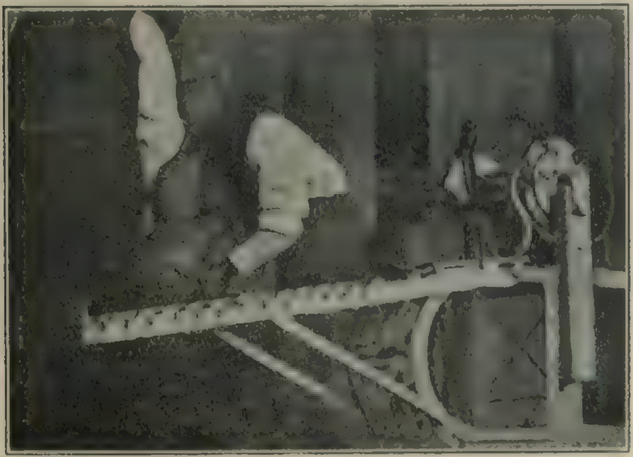


Fig. 3.—Bechtel Automatic Cut-off Machine in Operation.

Another class of hollow blocks finds a steadily increasing use. These differ from the porous blocks, in that they are made entirely from clay, with no addition of sawdust or other combustible material. They are in reality hollow rectangular tile, and being free from pores are stronger, and able to carry a much greater load. They are usually made 8 inches deep, by 10 inches wide, and 12 to 16 inches ling. They have two or three partitions inside the block to give greater strength, the material of all the walls and partitions is an inch thick. Blocks of this character have been used for a number of years for foundations of frame houses, barns, stables and frame structures in general. They build up a wall very quickly, and, being hollow, they offer a warm, dry and rather cheap form of masonry for foundations of frame buildings, whose weight is not great.

There is, however, another point in connection with their use which presents either a very strange coincidence or else a new and very important scientific fact Throughout Western Ontario a great many frame buildings are placed on hollow block foundations, and so far as the writer has been able to learn there has not been a building so placed struck by lightning. Enquiry at the last three conventions of the Canadian Clay Products Manufacturers has failed to bring forth a single case where lightning has struck a building so placed. This convention is made up of men from all over Canada, and the very men who would be most likely to know of such a case, stated that not one existed. Enquiry from fire insurance companies gives the same results.

Fig. 4.—Drying Yard, Showing Open Hacks Filled with Hollow Blocks.

An explanation of this suggests itself to the writer. Porcelain now finds a very large use as an insulator in all classes of electrical work. Porcelain is simply a burned clay, as are our hollow blocks described above. It is therefore quite possible that those hollow porcelain-like blocks do actually insulate a building from the earth, and thus leave it out of a possible electric circuit. Whether this is a fact or not, the writer does not say, but systematic enquiry for the past three years has failed to produce a case of failure. We must therefore admit that this is at least a very unusual coincidence, if not an actual scientific fact.—Professor M. B. Baker, in "Queen's Quarterly.*

*The photos used to illustrate this paper were made by the writer in the preparation of a report on clays and clay products of Ontario, published by the Bureau of Mines, 1906.

Self-distrust is the cause of the most of our failures. In the assurance of strength there is strength, and they are the weakest, however strong, who have no faith in theimselves or their powers.—Boyce.

King Edward Apartments, Toronto

The King Edward Apartments on Jarvis street, Toronto, which are illustrated in this issue, were built at a cost of $110,000, the architect being Mr. J. Hunt Stanford. As will be seen from the illustration, the apartments consist of two buildings. Each building contains three floors and a basement. In one of the basements is located a restaurant which serves for the use of the occupants and in which also accommodation is provided for catering to boarders from the neighborhood. Each floor contains four family suites and two bachelor suites, with bathroom for each suite. A telephone system is provided throughout the building, connecting the suites with one another, with the office, and with the Bell Telephone Company's service. A special feature, adding to the usefulness of the suites, is the installation of a series of dumb waiters.

The building is constructed of solid red brick upon a heavy concrete foundation. Each suite is separated from the others and from the halls by a fireproof brick wall, and the halls are also fireproof. The staircase from the entrance to the first floor is iron with marble treads. Front and back staircases are provided and a special arrangement is made for hoisting furniture to the upper floors without carrying it through the building. This is done by means of a steel girder across the area between the two buildings to which pulleys are attached. The entrance to the building is trimmed with marble. Each suite above the first floor is provided with a small balcony. In the basement there is a complete laundry equipment with tubs, washers, driers, etc., for the use of those who live in the building.

King Edward Apartments, Toronto.

No man can be a success in a position unless he is in love with his work, unless his best thought is devoted to it, unless he finds pleasure in doing it and doing it well.

Cost of Excavating

In a clay cut on railway work in Ontario County, Ontario cemented gravel was encountered. The bed of gravel lay along the bottom of the cut, and required a cutting of from eight-tenths to four feet. The gravel bed was so hard that a pick would only enter it about one and a half inches, but the extent of work was so small that the contractor did not feel justified in purchasing a pick plow.

The work required five pickers for four shovellers with, in addition, one man on the dump. The material had to be hauled up to one thousand feet, and four, and towards the end six, carts were required on the work.

In all 500 cubic yards were moved at a total cost of $387, or 77⅖ cents per cubic yard. The cost was distributed very much as follows: Shovellers, 1,016 hours at 15 cents per hour, $152.40; pick men, 817 hours at 15 cents per hour, $122.55; dumpman, 101 hours at 15 cents per hour, $15.15; carts, 543 hours at 18 cents per hour, $97.74; total, $387.84. From this it will be seen that the cost of picking or loosening of the material comprised about one-third of the total cost.

Surface Finish of Concrete.

In discussing the above subject "Engineering-Contracting" recently stated that "the minds of engineers are slowly but surely being weaned of the notion that nicety of form construction is the secret of handsome surface finish in concrete work." There is a very good reason for this, which is due to the plastic nature of concrete. It does not appear to advantage unless treated frankly. In the matter of blocks, however, the writer makes a pertinent suggestion after describing various methods of treating concrete surfaces by "scrubbing," etc. He continues as follows:

Returning to our main thought: what is to prevent the several methods of finishing concrete surfaces that we cited above being applied to concrete building blocks? Nothing, it would seem, but the expense. What is this likely to be? Tooling may be as expensive as we like to make it. Fairly good bush hammer work can be got at five cents per square foot, if pneumatic tools and common labor are employed, and we have known it to cost twenty-five cents per square foot, when done by hand and by stone cutters at $4 per 8-hour day. At five cents per square foot it adds 4½ cents to the cost of an 8x16 inch block to bush hammer one face. In the matter of tooling blocks, however, it is not so much the securing of a rough tooled surface that is wanted as it is to cut away the dull and lifeless surface skin, and where is the difficulty of doing this by grinding? Though we do not now recall where, we believe that this method has been tried and, using coarse carborundum wheels, as we recall it, with fair success. A portable grinder which one man could manipulate by carrying it from block to block like a pneumatic tool should not be difficult to devise, and in fact such tools are now on the market which would very likely serve the purpose.

An Interesting Example of Residential Architecture in Toronto. Geo. W. Gouinlock, Architect.

Reinforced Concrete Ties Favored Abroad

The following is a report on the manufacture of reinforced concrete ties in Italy, by U. S. Consul Chapman Coleman, of Rome, who says that the information was furnished by the Italian state railway authorities, the Gabellini Cement Company, and others:

The Italian Government has ordered 300,000 of these ties, which are now in course of construction. A few thousand of such ties, ordered for experimental purposes, were constructed by the Gabellini Company some years ago, and have been used on the railroad from Castellamare-Adriatico to Ancona. As a result of the trials to which the ties were subjected a new design, to be employed in executing the present large order, will replace the old. The principal change will, it is understood, be found in the introduction into the concrete mass of a larger number of the reinforcing metallic bars, of reduced diameter, in the new design of ties.

The cost of a concrete tie is estimated at about $1.20, and it is believed that its endurance will be from three to four times as great as that of a wood tie. A tie will weigh about 286 pounds, inclusive of the weight of the metallic reinforcement, about 28 pounds. A comparison of the respective cost and value of concrete and wooden ties would, no doubt, give different results in Canada from those afforded in the Italian estimates, owing to varying conditions in the two countries affecting local cost of materials and manufacture, endurance, etc. The belief is entertained that the concrete tie will eventually entirely replace the wood tie.

Every progressive carpenter will find much that is useful in "Short Cuts in Carpentry," by Albert Fair (New York: Industrial Publication Company). A reading of this work sustains its claim to be "a collection of useful problems giving new and improved methods of laying out and erecting carpenters' work." To lay out and erect carpenters' work accurately and quickly is an accomplishment desired by all good carpenters. In this book, not only the simple rules for the short cut are given, but also the "reason why," so that the carpenter can apply his knowledge to many problems besides those given. Price, 50 cents.

The building of apartment blocks will again be a feature of the building trade in Winnipeg this season, and many handsome edifices of this description will be erected this spring in all quarters of the city.

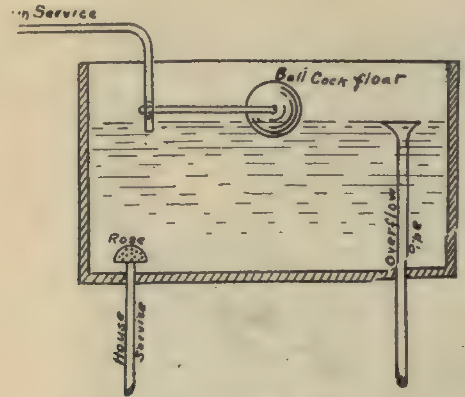
CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

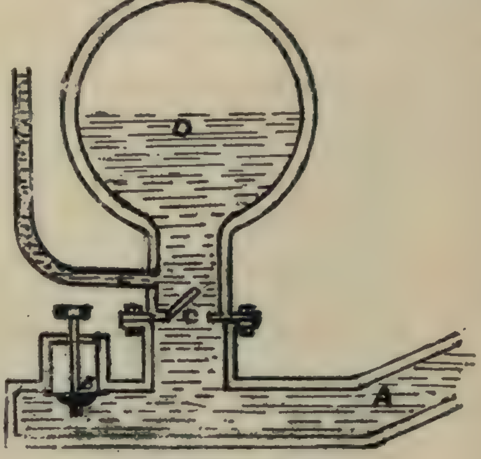
Water and Sewage Problems in the Country Home

PROFESSOR EVANS

The problem of providing a continuous water supply for the country home is no longer a speculation. Many efficient systems may now be installed at a moderate cost. In every case it is desirable to have a regulating cistern or tank as a means of storing the water for distribution by pipes to every part of the homestead where it is required. An elevated tank may be used to deliver the water by gravity or a pneumatic tank by air pressure. The advantages of the pneumatic over the elevated tank are many. The tank and pipes can be easily made frost proof in winter, and the water is kept cooler in summer. It is closed to dust and light, and has the additional advantage of resting on the solid ground. The same means may be utilized to force the water into a pneumatic tank as used to elevate it to a gravity tank, that is, by a windwill, gasoline engine, hot air engine, hydraulic ram or by hand. Which will be the most convenient and economic will depend upon the situation, the source of supply, amount required, and the need of power for other purposes. The engines have the merit of being ready to pump whenever required and at the same time to perform some other work besides. The windmill and the hydraulic ram have the advantage of operating without fuel. The windmill, unfortunately, has to depend on atmospheric conditions which, when water is most needed, there is "neither breath nor motion" in it. The hydraulic ram on the other hand is a machine which works continuously day or night, in calm or storm, steadily, uniformly, requiring neither supervision nor fuel. A sectional view of this machine is given, which will help to explain its operation. A is the supply pipe conveying water, which enters the ram at B, from the spring. The valve B opening downwards allows the water to escape, producing a current along the pipe A. The water increasing in velocity closes the valve B, arresting the motion suddenly, causing a reaction of sufficient pressure to open the valve C, which allows a portion of the water to enter the chamber D. Thereupon the valve B drops again by its own weight setting the water once more into motion towards that point, and so relieving the pressure at C, closing the opening. This process is repeated continuously, the valves B and C opening and closing in turn, forcing the water up the pipe E, which discharges a constant stream of water. It is essential that the ram be placed at a lower level than the spring so that the supply pipe may have a fall into the ram. The relation between the height of source of supply above the ram and the elevation to which the water is to be raised determines the proportion of water delivered to the water wasted, and the length of the drive pipe depends upon the fall to the ram and the height to which the water is lifted.

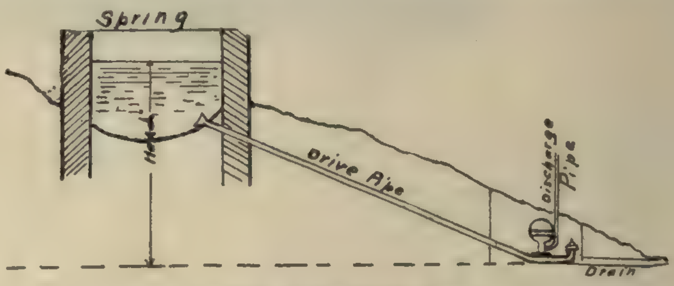


Water Tank.



Hydraulic Ram.

Another question of vital import is that of sanitation. It has been a much debated subject among sanitary authorities as to whether a cesspool can be constructed so as to be perfectly sanitary and satisfactory. This is not only possible, but much to be preferred in every way to the outhouse both as to comfort and sanitation. A cesspool built as per illustration is regarded as the most sanitary layout for the amount of money it will cost that can possibly be constructed. As to its construction a great deal depends, of course, on existing conditions, such as location, soil and the amount of money to be expended. Its capacity may be made sufficiently large so that it will not need to be emptied more than once a year.



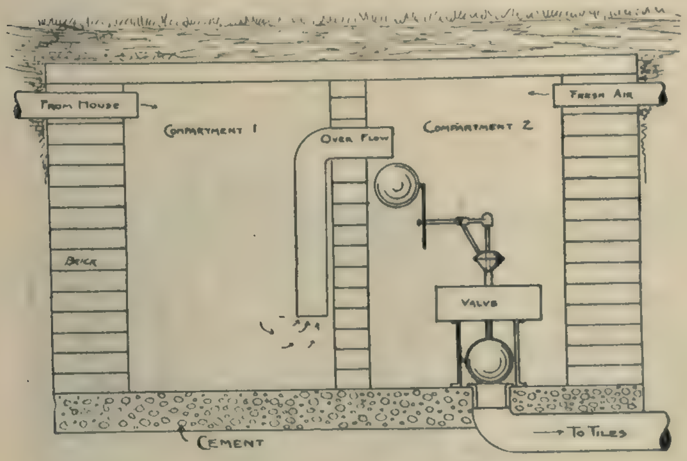
Setting of Hydraulic Ram.

The Ventilating Feature of Hot Air Heating

The people of this generation are much more intelligent in the matter of hygiene and sanitation than any preceding generation, said W. A. Andrews in a recent address before the Federal Furnace League. People are familiar with references to, and discussions of, questions of health and healthful surroundings; experience has taught many people that fresh air, the one thing which is unlimited and costs nothing, is not only essential to our existence, but has great powers in overcoming certain disturbed conditions arising in the human body.

With this basis it ought not to be very difficult to convince a person that a warm-air furnace, which brings into the house, whenever the furnace is employed for heating, a constant supply of fresh air from out-of-doors, has, in this fact alone, sufficient claim for preference over a steam or hot-water boiler, which simply warms over again the air which was in the room when the heating was started.

The boiler men make great claims for their apparatus, that much less fuel is consumed; but if the warm-air furnaces did only what the water or steam boiler does, the probability is that the warm-air furnace would consume less fuel than the boiler, for if the air from the various rooms be taken back to the furnace and warmed over and over again it is quite a different task from taking air from out-of-doors at zero, or lower, and immediately raising it to 70 degrees.



Cesspool for Country House.

With institutions established in various parts of the country for those suffering with pulmonary troubles to sleep and live out of doors that they may be constantly in the fresh air, with the very practical demonstrations constantly before us of young people's health being much improved by out of door exercises, with adults seeking the benefits of out-door exercise in golf, boating and touring in automobiles, it should be a very easy matter to make it evident to every reasonable person that when we are within our homes we can poorly afford to dispense with the fresh air which is so essential to our health.

If the warm-air furnace men were to resort to questionable means, they would denounce in the strongest terms the unhealthfulness of steam and hot-water systems. Let it be understood that no reference is made to indirect steam or hot-water heating in the foregoing. This form (the indirect) supplies fresh air; but its construction and its operation are so very expensive that only the wealthy can afford to have it, and the places where it is used are so few that that phase of the question is negligible.

As though warm-air furnaces had not had troubles enough, it is, in addition to all those already referred to, subjected to the very important one of having its rights neglected by the architect in planning a house to be heated by warm air. The architect in making his plans too frequently positively refuses to take into consideration the fact that in order to do its work properly, the warm-air furnace must have certain conditions provided for it; but the furnace is planned to be put where it is at great disadvantage in the matter of distributing heat; the pipes have to be carried through awkward, out-of-the-way places, to the great disadvantage of the flow of air; and too often with insufficient space for the proper capacity.

It is to be hoped that the architect can be brought to see that proper provision must be made for the warm-air furnace, as much as for a water service, or a gas service, or an electric lighting outfit; and that its claim for room and proper arrangement cannot be entirely ignored.

A Word to Plumbers

The journeyman plumber sometimes prides himself in dodging the regulations because in doing so he fools the inspector. In doing this he makes several mistakes. The regulations in regard to the weight of pipe, methods of making joints, repairing leaky and cracked pipes, and many other things relating to practical details of work, were all made by practical men, by experienced plumbers who were first-class. The rules were formed so as to insure first-class work, and as they were making the rules for themselves they did not make them in such a way as to increase the cost of workmanship.

In olden times, when plumbing rules were new, the journeyman said to himself that there was no reason for putting ¾-pound of lead per inch diameter into the hub of an extra heavy pipe, so with some old newspapers in the bottom and oakum on top of that, he filled up the hub until a thin ring of lead filled the hub approximately flush. This took rather more time than putting in the ordinary quantity of oakum. The thin ring of lead required very careful calking and sometimes had to be taken out and poured a second time. But in the end he effected a saving of 1, 2 or 3 pounds of lead, according to the size of the joint. This gave him great satisfaction.

On one occasion where work of this kind had been done it was brought to the attention of the boss plumber, who happened to be of the type known as a "skin." He had no love for inspectors or rules, but he remarked in regard to the work: "Didn't the fool know that while he was saving 12 cents worth of lead he wasted 25 cents worth of time?" There are a great many such economies in plumbing. Savings can be made in the expenditure of material, but they cost more than they are worth With a thin ring of lead, unless unusual care has been taken with the oakum, the lead will sink in places, being driven down before it expands so as to fill the joints. Where a line is subject to a water test, a few such joints will cost perhaps twice as much in time as if it had been made in the regulation way.

Cracked lengths, cracked hubs, blow-holes that cannot be plugged, and other similar defects are often put in place with the hope of getting them passed by the inspector. If they are found, the usual song is, "We didn't see them," or "We hadn't noticed them." Such an answer would pass muster if the blow-holes were not always carefully turned so as to bring them out of sight. It is far better for the master plumber frankly to condemn such a pipe and refuse to put it into the job than it is to run the risk of having to take the defective pieces out.

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

A Reinforced Concrete Arch

The Orwell bridge, herein illustrated, is constructed over Catfish Creek, at Orwell, Ont. It is a single arch of 75 feet span and in its construction is similar to the Lynhurst bridge, recently described and illustrated in the "Contract Record," the concreting mixtures being of practically the same proportions. The Orwell bridge is designed to carry a live load of 150 pounds per square foot of floor, or a concentrated wheel load of 15 tons on two axles, 10 feet centres. The type of reinforcement used was the same as in the Lynhurst bridge, in this case being lighter on account of size of bridge, and the heavy longitudinal bars were 1 x 1-inch, Kahn system. The railing was a heavy solid panel type, one foot in thickness, and the expansion joint was continued from the extrados to top of rail. The total length was about 80 feet and 18 feet wide over all, giving a roadway clearance of 16 feet.

This bridge was designed by Mr. James A. Bell, C. E., City Engineer of St. Thomas. The work of construction was placed in charge of Mr. A. Gillies, a graduate of the School of Practical Science, Toronto,

The Orwell Bridge Over Catfish Creek.

Durability of Concrete Sewers

The question of the durability of concrete sewers has been raised first by those who have an interest in the use of other materials and, second, by such occurrences as that reported from Great Falls, Mont., and is the subject of much study, observation and experiment, says a writer in "Domestic Engineering."

The ordinary use of cement pipe for carrying sewage has continued for many years and there are now many miles of concrete and reinforced concrete sewers in existence as well as of plain and reinforced concrete pipe sewers. There have been some failure of cement pipe sewers, but the circumstances surrounding them do not seem to have cast any doubt upon their suitability for carrying sewage, the quality of the materials or of the workmanship used in making the pipe being the cause of the failure. There are on record occasional instances of the destruction of concrete by the discharge of waste from chemical works, and probably cement pipe sewers carrying such discharge would be affected thereby. The same would be true of the cement used in laying brick or in jointing vitrified pipe sewers, and to a certain extent of those materials also. In the Great Falls case referred to the investigators are fully satisfied that the sewage has no effect upon the cement.

Stale sewage, undergoing putrefaction in a tank, may have a deteriorating effect on concrete which would not be observed in a sewer where the flow of sewage is continuous and sewage is comparatively fresh. Thus Mr. W. S. McHarg and Mr. W. S. Shields, of Chicago, report that concrete septic tanks four or five years old have deteriorated very seriously. Neither of these engineers seems to be prepared to attribute the deterioration unquestionably to the action of the septic sewage upon the concrete, and both are making observations upon the conditions in other tanks and in concrete outfall sewers therefrom to determine if possible the cause of the deterioration and the extent of the action in case it can be attributed to the sewage.

In the Great Falls case Mr. E. T. Tannatt and Mr. Edmund Burke, of the Montana Agricultural Experiment Station, found serious deterioration of concrete sewers and of cement mortar and joints, and also of bricks in brick sewers. Their conclusions are in brief that the deterioration in the brick was due to softness of the brick; that the deterioration in the Portland cement used in the mortar for the brickwork, as well as in the concrete sewer, was due to the alkali in the soil, which was carried into the mortar or concrete by the ground water. This action seemed to be independent of the height of the sewage in the sewer and to be strongest at an elevation above that of the sewage but below that of the ground water.

J. Y. Jewett, of the U. S. Reclamation Service, re-

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ports, in a paper before the American Society for Testing Materials, that he has observed deterioration of concrete structures at about the soil line in alkali soils and that this action is similar to that of sea water upon concrete. If this latter suggestion is shown to be correct, it should be possible, by selecting the cement carefully, to find one which will be safe for use under such conditions. Puzzolan and some brands of natural hydraulic cements may prove the proper materials to use, rather than Portland cement.

A cement water pipe 18 years old, in southern California, is reported to be quite seriously clogged by the collection of gravel and lime on mortar projecting from the joints, which hardened and continued to increase the deposits. There is no definiteness about this report, but its indications, so far as they go, are that the composition of the alkali in the soil is the determining factor as to whether the cement pipe will deteriorate or not.

The Question of Tarred Roads

The question upon which was concentrated the most acute discussion and which brought out the sharpest diversities of opinion at the recent International Road Congress was the use of coal tar as a surfacing material for roads to prevent erosion from rapid traffic, protect the roadway from infiltration of water, and for the suppression of dust. On this subject the delegates were somewhat sharply divided, with the advocates of tar—when properly applied—somewhat largely in the majority.

It was maintained by the opponents of tarred roadways that tarring is only a temporary and therefore expensive expedient; that it reduces but does not wholly suppress dust; that the tar is ground up by steel-shod motor tires, and being mixed with ordinary dust is irritating and injurious to the lungs; that it kills trees and other vegetation along roads on which it has been used, and that cattle refuse to eat grass in pastures and meadows upon which tar-impregated dust has settled from the adjacent roadway.

The advocates of the tarring process maintained, on the contrary, that when properly applied in warm, dry weather to a well-built road with a good surface and free from flooding or subterranean infiltration of water tar forms a cheap and excellent protective surface which not only minimizes the wear of traffic upon the roadway, but practically suppresses mud and dust. It is not denied, however, that on heavily travelled thoroughfares the only really satisfactory method of application is by mixing the crushed rock or other surfacing material with tar or asphalt to the depth of two inches or more. This being laid on a good concrete and rubble foundation and rolled down hard and smooth forms the best surface for a macadamized road in all weathers and seasons that has yet been devised. Moreover, it is claimed that the complaints about the dangers of tar dust to lungs, trees and vegetation are more or less imaginary and have been exaggerated by newspapers and by persons interested in other road-surfacing materials. However this may be, the congress finally adopted a resolution approving the use of tar when properly laid under favorable conditions.

A good test of the tenacity of brick masonry laid in cement mortar was recently seen in West Terre Haute, Ind. A cistern 10 feet deep, 7½ feet in diameter, with the top portion drawn in to a manhole, resembling the top part of a jug, had been completed, but no water had been turned into it. By the breaking of the Wabash River through a levee, the town was flooded, and the cistern floated from its foundation and turned over on its side, without fracture. It continued to float as long as high water lasted.

Public Works Department Expanding

The report of the Deputy Minister of Public Works of Canada for the fiscal period ending March 31, 1908, states that the continued expansion of this large branch of the public service is shown by the Accountant's statement of expenditure for the fiscal year 1907-8, which reached a total of $11,199,384.94, an increase of $1,851,959.63 over that for the year 1905-6, which must be used for purposes of comparison as, owing to the change in the fiscal year, the preceding report for 1906-7 covered only a period of nine months. The details of the expenditure follow under the various divisions of departmental operation:

Harbor and river works	$2,447,882 02
Dredging and plant	3,344,306 56
Slides and booms	144,716 54
Roads and bridges	19,158 84
Public buildings	4,331,901 40
Telegraph lines	462,233 43
Miscellaneous	449,186 15
Total	$11,199,384 94

Reviewing the annual reports for the past few years, it is interesting to note, by comparison, the work of the department which has necessarily kept pace with the development of the country.

In the year 1897 the total expenditure was $1,744,654.21. This had grown by the year 1900 to the sum of $3,563,026.34. The total expenditure for 1904 reached $6,492,273.52, while the amount expended as given in detail above for the year 1908 amounted to $11,199,384.94.

The revenue collected by the department, during the year under review, shows a total of $299,430.18, an increase of $38,115.51 over 1906. The details of the revenue are as follows:

Slides and booms	$ 86,760 67
Graving docks	63,208 58
Rents	17,189 08
Telegraph lines	121,553 57
Casual revenue	10,718 28
Total	$299,430 18

With the exception of the casual revenue, each of the individual divisions of the revenue shows an increase over that of the preceding year. Taking the same years which were used for a comparison of the expenditure, the revenue of the department shows a steady increase, progressing from $128,790.83 in 1897 to $133,562.92 in 1900, $273.062.59 in 1904 and $299,430.18 in 1908.

The total expenditure in this branch of the service, including dredging, slides and booms and roads and bridges, amounts to $5,956,063.96. Of this amount $3,344,306.56 was expended in dredging for the improvement of harbors and navigable streams.

The total expenditure on construction and maintenance of public buildings during the year amounts to the sum of $4,331,901.40, which covers not only the construction of new edifices, but all requirements connected with the maintenance of those already erected, their repair, heating, lighting, etc. In the year 1888 the cost of public buildings' maintenance amounted to $261,589.63; in 1898, $334,732.20; in 1903, $549,488.86, while by the year 1908 it had reached the sum of $932,447.63.

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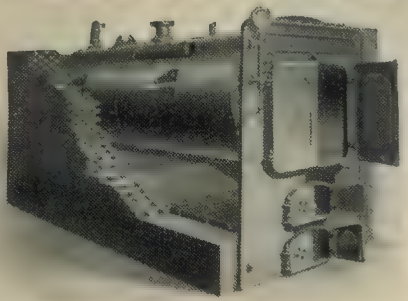

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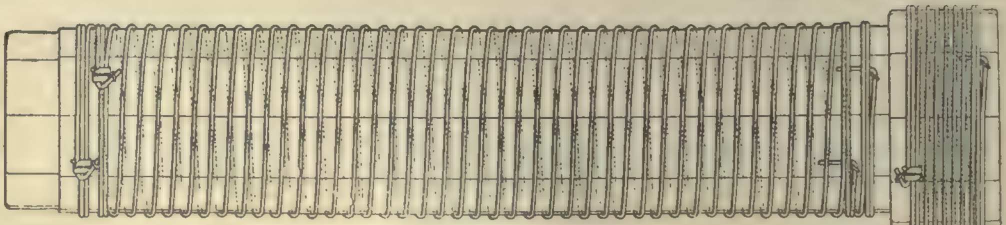

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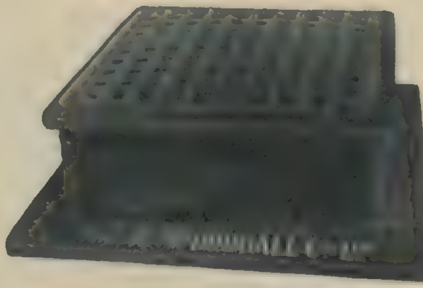

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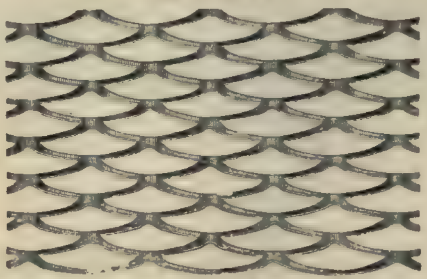

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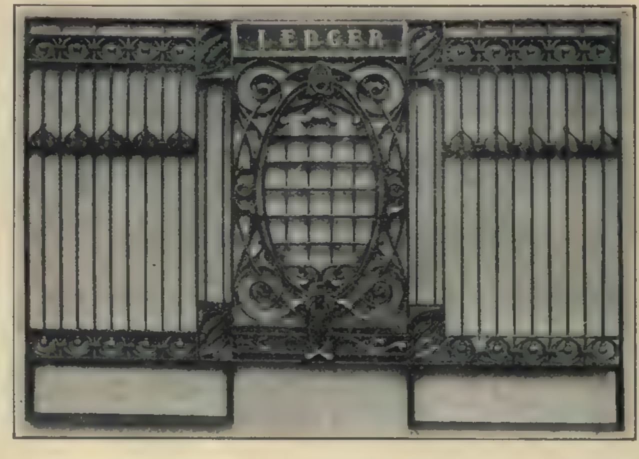

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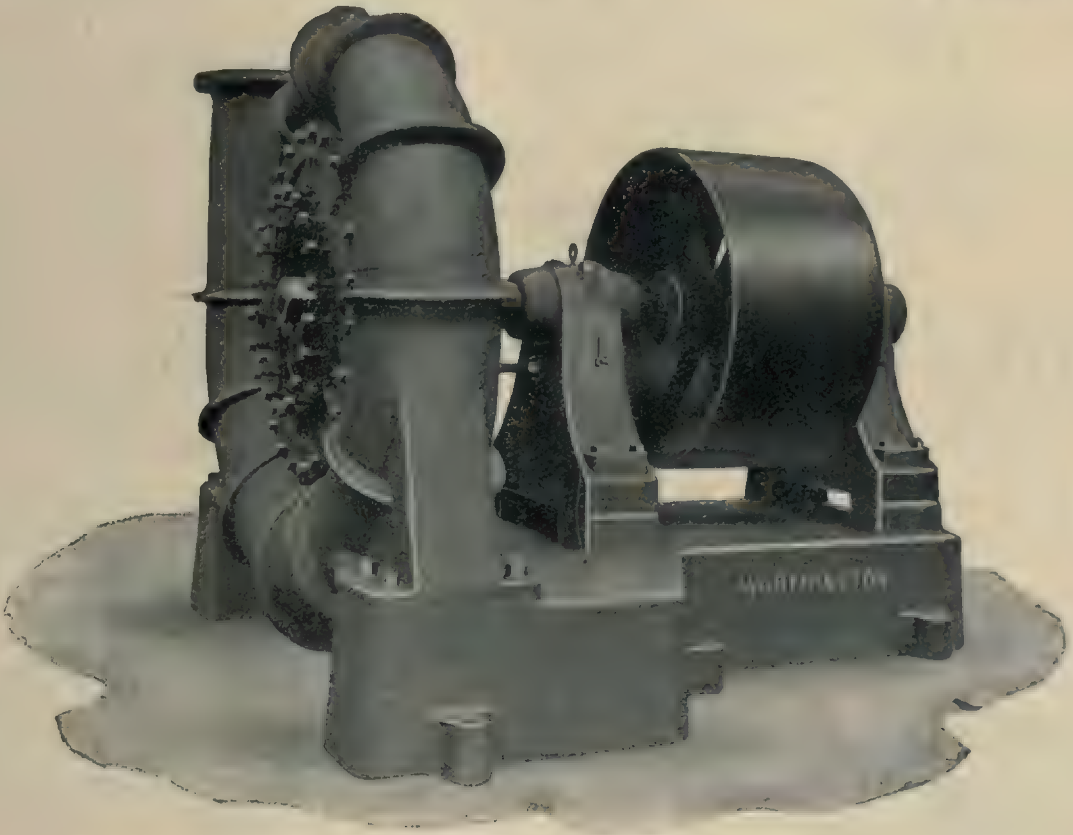

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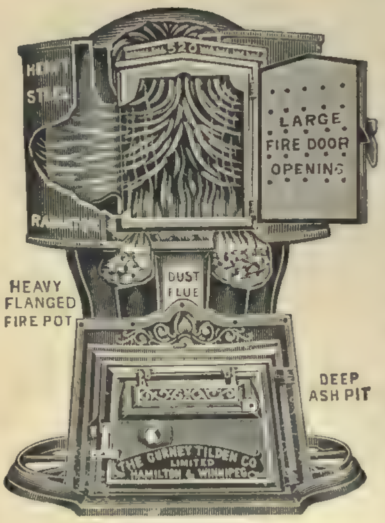

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This pan may be placed in any part of the outside casing to suit the convenience of the owner, providing that it is placed down at the bottom of the casing. This not only makes it easy of access but the actual tests that determined the proportions of the pan demonstrated that this was the position that gave best results.

When the pan is high up it gets too much heat and the water boils over and rusts out your furnace. Some makers put a water pan high up simply because their one idea in making the furnace is to have it cheap. Every part of the New Idea has been arranged after careful tests and good results are the only thing that count with us in deciding about matters of this kind. If you want to have a furnace that will surely give you more than a few years' wear, carefully avoid all furnaces with high up water pans.

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Waterworks, Sewerage and Roadways

Claresholm, Alta.

The ratepayers will be asked to vote a sum of $70,000 for a waterworks system and electric light plant.

Edmonton, Alta.

The contract for the installation of a filtration plant has been awarded to the Roberts Filtration Company of Philadelphia.

Etobicoke Township, Ont.

Application will be made to the provincial parliament to authorize the municipal council to install a sewerage disposal plant for sanitary sewer and drainage purposes, and to issue bonds for the cost of same.

Hamilton, Ont.

It is estimated that $53,840 will be required by the Waterworks Department for improvements, which include $25,975 for the beach pump-house. $67,000 will be required for water works construction, this amount including $35,000 for extension of mains and $20,000 for new services.

Ladysmith, B.C.

Tenders addressed to N. A. Morrison will be received until March 15th for the construction of sewerage works for this city. Plans and specifications may be obtained on application.

Montreal, Que.

Tenders will be received until March 9th for general supplies and materials for permanent sidewalks and pavements. Address City Surveyor, City Hall, Montreal.

New Toronto, Ont.

J. Macpherson, of Islington, Clerk and Engineer, states that bids will probably be received in May for the construction of a sewage disposal plant, to cost about $14,000.

Sarnia, Ont.

Application is being made to the Provincial Legislature to authorize the town to pass a bylaw for the raising of $9,700 for the construction of brick pavement around the market square, etc.

St. John, N.B.

The Water & Sewerage Board have instructed Mr. F. A. Barbour, consulting engineer, to report upon the best method of making the necessary repairs to No. 2 section of the waterworks extension.

Thessalon, Ont.

A by-law to issue debentures for $9,757,050 for waterworks and electric lighting system has been validated by the Railway and Municipal Board.

Toronto, Ont.

The controllers have decided to reduce the contractors' guarantees for asphalt pavements from ten to five years. This was done on the advice of City Engineer Rust, who said that it will mean a reduction in the cost of the pavements.

Victoria, B.C.

The City Council are considering the paving of Douglas street with wooden blocks on concrete foundation from Humboldt street to the Fountain.

Weyburn, Sask.

Tenders will be received until April 7th by the Secretary-Treasurer for sections of the proposed system of waterworks. (See advertisement.)

Winnipeg, Man.

Tenders addressed to J. H. Blackwood, Secretary, Public Parks Board Office, will be received until March 8th for lining a water tank of 16,000 gallons capacity, situated in Assiniboine Park, St. Charles, 26 gauge galvanized iron to be used. Specifications may be seen at the office of the Board at the city hall.

The City Engineer has presented to the Board of Control his report on cost of constructing sewers, and estimates cost as follows: Combined intercepting sewers from Colony and Assiniboine avenues to Red River north of city, including Cornish street system, $1,225,000, or storm sewers in same section for dry weather flow only, $400,000. For combined intercepting sewers from Assiniboine River at Clifton street to Red River north of city, including capacity of that portion of Ward 1, west of Cambridge street, $3,077,080; sanitary sewers for same section for dry weather flow, $750,000.

Yorkton, Sask.

The Council have adopted the report of the water and sewerage committee in favor of extending the system at an estimated cost of $50,000.

AWARDED.

Ottawa, Ont.

The following contracts have been awarded for the year's waterworks supplies: Hydrants and valves, Thomas Lawson & Sons, Limited, Ottawa, $2,644; cast iron pipe, T. Sidney Kirby & Company, $15,065.10; lead pipe, McKinley & Northwood, $1,306.77; brass goods, James Robertson, Montreal, $987.95.

Victoria, B.C.

Tenders for supply of cement to the city were as follows: R. P. Rithet & Company, $2.51 1- 2per barrel; Robert Ward & Company, $2.65 per barrel; Bostock & Company, $2.51 1-4 per barrel. The contract was awarded to R. Rithet & Company.

Tenders for the supply of 6-inch valves on the 24-inch main were as follows: W. S. Fraser & Company, $11.50 each; E. G. Prior & Company, $13.50; Crane Company, $15.00. The contract was awarded to Fraser & Company.

Railroads, Bridges and Wharves

Edmonton, Alta.

The enlargement of the Saskatchewan bridge will be brought before the Dominion Government early this session.

Montreal, Que.

Plans for the new Montreal Harbor Works, which it is expected will cost about $20,000,000, will be submitted to the Minister of Marine before the end of the present session. It is not expected, however, that work will commence until the spring of 1910.

Peterborough, Ont.

The County Council will rebuild or repair Hope's bridge, Steel's bridge, Robson's bridge and McColl's bridge.

Quebec, Que.

In answer to a question by Mr. R. L Borden, the Minister of Railways & Canals, stated that it was expected that plans and specifications for the rebuilding of the Quebec bridge would be completed this year and tenders taken.

St. John, N. B.

The C. P. R. are negotiating for city property upon which to construct yards and terminal facilities at a cost of $250,000.

Toronto, Ont.

Tenders addressed to A. J. McGee, Secretary-Treasurer, T. & N. O. Railway Commission, will be received until March 17th for construction of engine house, machine shop, stores, etc., at Cochrane, Ont., and various concrete arch culverts. (See advertisement.

Vancouver, B.C.

Engineers Waddell and Harrington have submitted their report in connection with the proposed bridge over False creek at Cambie street. The report is based on three different types of bridges at the point, a low-level throughout, a structure with high-level approach at the north end and low-level terminus at the south end, and a high-level bridge throughout. For the low-level bridge the engineers' report shows a structure of which 1336 feet of the total length of 1950 feet is composed of embankment and fill, the cheapest form of bridgework. Seven spans are provided, a draw span of 93 feet in the clear between piers and three 80-foot deck spans on either side. The estimated cost of this work is $432,000. The plans for the high-level bridge at the north end and low level at the south approach are shown in three different forms. One is based on a steel structure. The estimated cost of this bridge is $595,700, but as a portion of the work is of temporary character, $169,825 must be expended in the future to make the work absolutely permanent, bringing the total cost for a permanent bridge of the type to $765,525. The second type of this class is built with temporary wooden approaches and is estimated to cost $445,000, to which $186,150 must be added to make the structure permanent, making a total cost of $632,150. The third type is for a complete steel bridge of permanent type throughout, the structure being estimated to cost $579,500. Three separate plans are also given for the complete high-level bridge throughout. For the bridge with retaining walls on the shore end, $747,500 is given as the first cost, with $274,500 additional for making the work permanent, a total of $1,022,000. For the structure with temporary wooden approaches, $549,000 is called for in the first instance with $237,950 for making the work permanent in character, a total of $786,950. For the completed bridge of steel in permanent form, $718,000 is noted as the probable cost. The engineers have provided in the plans for a double-track tramline.

West Algoma, Ont.
Tenders have been taken, but no contract has yet been awarded for the construction of a wharf at Michipicoten river. The Public Works Department have the matter under consideration.

Public Buildings, Churches, Schools, etc.

Bonaventure, Que.
Plans have been prepared for the erection of a frame club house for La Cercle Pie. Estimated cost, $12,000. Ouellett & Levesque, architects, Quebec.

Dartmouth, N.S.
Tenders are invited by C. P. Chisholm, Commissioner of Public Works, Halifax, N.S., until March 15th, for the installation of galvanized iron piping in connection with the heating system in the Nova Scotia hospital. Specifications may be obtained at the office of the Medical Superintendent of the hospital.

Duncan, B.C.
It is proposed to erect a high school at this place.

Goderich, Ont.
The Alexandria Marine & General Hospital contemplate the erection of another wing to their building.

Halifax, N.S.
Tenders addressed to C. P. Chisholm, Commissioner of Public Works, will be received until March 5th for the installation of a heating system in the Technical College. Specifications may be obtained at the Commissioner's office or at the office of Herbert E. Gates, architect.

Indian Head, Sask.
Plans for the construction of a fire escape annex to the school building have been adopted, and tenders will be called for at once.

Word was recently received by the town council from Superintendent Taylor that the new $17,000 depot will be built and completed this summer.

Kincardine, Ont.
Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until March 19th for heating apparatus for the public building. Plans and specifications at office of Mr. Angus Kerr, Clerk of Works, Kincardine, and at the Department of Public Works, Ottawa.

Kamloops, B.C.
Mayor Robinson has presented to the City Council a scheme for the erection of a new city hall and the carrying out of other public works at a total cost of $100,000.

Kenora, Ont.
The Town Council and government are negotiating re the construction of a court house in this town.

London, Ont.
The Thames River Boating Club are thinking of building a new boathouse.

Tenders close March 3rd for the construction of a school house at Chelsea Green. Address W. G. Murray, Masonic Temple, this city, or H. Bourne, 25 Adelaide street, Chelsea Green.

Montreal, Que.
The Railway Commission have granted the application of the C. P. R. for permission to extend the Windsor & Place Viger stations.

Plans have been prepared for alterations to the building which was formerly the Protestant Infants' Home, and which will now be used as a dance hall.

Moose Jaw, Sask.
R. E. Manly, the local secretary of the Y. M. C. A., states that the construction of the new association building will be commenced this spring.

Norwood, Ont.
The Provincial Government will be asked to aid in the erection of an agricultural school here.

Ottawa, Ont.
Mayor Hopewell says that he will recommend the calling of new tenders for a combination grand stand, fire station and auxiliary police station.

A new school section has been formed in Cumberland, and a building will be erected in the spring.

Peterborough, Ont.
Plans for the proposed public library are being received up to March 10th.

Port Colborne, Ont.
The trustees of the Presbyterian church will reconstruct at a cost of $2,000, their building recently destroyed by fire.

Prince Albert, Sask.
Creighton & McConnell, architects, will take tenders about March 15th for the erection of a brick school building in this city for the Separate School Board. Estimated cost $10,000. The architects' plans for this building were adjudged first place in competition.

Quebec, Que.
Stopes & Fuerstman, Saranac Lake, N.Y., are reported to be preparing plans for the erection of two sanitariums, one for this city and one for St. Agathe, Que.

Regina, Sask.
Mayor Williams states that the construction of the new hospital will be commenced this season and that the contract will be awarded upon the completion of the civic audit.

Saskatoon, Sask.
Plans have been prepared for a $10,000 building for the Saskatoon Club.

St. John, N.B.
Plans for the proposed extensions for the provincial hospital are now being prepared. Estimated expenditure, $100,000.

St. Agathe, Que.
Stopes & Fuerstman, Saranac Lake, N.Y., are stated to be preparing plans for the erection of a sanitarium at this place.

Stratford, Ont.
The trustees of S. S. No. 3, Tuckersmith, have decided to build a new school this season.

St. Roch's, Que.
The Caisse d'Economie, Notre Dame de Quebec, have accepted the plans of R. R. Lemay, architect, in a competition for plans for their new branch at this place.

Stanford, Ont.
Tenders are invited by C. M. Borter, architect, Niagara Falls, Ont., for the construction of a four roomed brick school building for school section No. 4.

Toronto, Ont.
It is stated that an encouraging amount has been received in connection with the fund for raising $100,000 for new buildings for Knox college.

It is reported that $250,000 has been bequeathed with which to erect a building to be known as the Burns Memorial. Davis S. Kidd, 17 Lennox avenue, is interested.

Tenders are invited by Shea's Yonge Street Theatre Company until March 8th for the erection of a theatre on the southwest corner of Victoria and Richmond streets. Plans may be seen at Shea's Theatre, Yonge street.

Tenders addressed to Jos. Oliver, Chairman, Board of Control, will be received until March 16th for the various contracts in connection with the new palm house and boiler house in Allen gardens. (See Advertisement.)

Vancouver, B.C.
A new Roman Catholic church will be erected at Mt. Pleasant.

The Y. W. C. A. are stated to be planning the extension of their building.

The Hindus of this city have secured a site in the North End for the erection of a temple.

Victoria, B.C.
A six storey apartment hotel, to cost approximately $200,000, will probably be erected at the corner of Georgia and Burrard streets. Major Mothersill is interested. W. A. Richards is the architect.

Welland, Ont.
Plans have been accepted for the remodeling of the Presbyterian church and the addition of a school room.

Westmount, Que.
The congregation of St. Matthias have decided to proceed with the construction of a new church at a cost of $45,000. Ross & Macfarlane, architects.

Winnipeg, Man.
The officials of the Children's Home are contemplating either a new building or extensive additions.

A deputation waited upon Premier Roblin on behalf of the Homes of Aged People. It consisted of Mayor MacDonald, K. L. Johnston, Dr. Clark and others. The deputation laid before the Premier the project of putting up a new building at a cost of from $40,000 to $50,000. Every consideration was promised.

AWARDED.

Fort Erie, Ont.
The contract for the new public school has been awarded to Edgar Burgar, of this place. C. M. Borter, Niagara Falls, architect.

Halifax, N.S.
The contract for the new building for the Children's Hospital has been awarded to Walter Lownds at about $15,000.

Ottawa, Ont.
The tender of Courtney & Brown, at $68,600, reinforced concrete construction, for the proposed new grand stand at the exhibition grounds is recommended for acceptance.

Toronto, Ont.
The Don Valley Pressed Brick Company have been awarded a contract for 1,000,000

brick for the new Transportation Building at the Exhibition Grounds.

The contract for the erection of the new Transportation Building at the Exhibition Grounds has been awarded to Frank Armstrong, 296 Berkeley street, at $85,279, with $2,640 added for a maple flooring. The cost of the structure, as estimated by Architect Gouinlock, was $86,000. Eight tenders were received, the highest being $110,000. The building will be 337 feet long by 153 feet wide. The materials will be red pressed brick and cut stone.

At a recent meeting of the Property Committee of the Board of Education, tenders for the new buildings for Fern avenue and the Girls' Home were received, and the contracts awarded. The following are the successful tenderers on Fern avenue school :W. H. Martin, carpentry work, $7,400; Ballis & Son, masonry, $11,000; J. Phinnemore, painting, $1,025; Frank Armstrong, plumbing, $750; Beaver & Company, plaster work, $1,460; Flowers & St. Ledger, roofing, $1,090; Rutley Ventilating Company, heating and ventilating, $1,000; McGregor & McIntyre, steel construction, $1,264; Expanded Metal Company, steel for fireproof floors, $1,455. For the Girls' Home the following contracts: Balderston & Hutchison, masonry work, $4,207; W. F. Armstrong, carpenter work, $4,453; Jas. Phinnemore, painting, $395; Fred Armstrong, plumbing, $350; Blackburn & Sons, glass work, $546; R. Rennie & Sons, roofing and tinsmithing, $680; Rutley Warming and Ventilating Company, heating and ventilating, $840; Reed & Brown, structural steel, $287. The tenders for iron stairs for Fern avenue, Leslie and Morris streets were referred to a special committee. The contract for floor tiles was obtained by Aikenhead Hardware Company at $62.50.

Vancouver, B.C.

The contract for the new bathing pavilion at English Bay has been awarded by the Park Commissioners to Albert Adams, the lowest tenderer, at $24,600.

Wainwright, Alta.

The contract has been awarded by C. W. Speers, general colonization agent for the Dominion Government, for the construction of an emigration hall at this place. Estimated cost $35,000.

Residences

Toronto, Ont.

At a recent meeting of the West End Y. W. C. A., plans for the proposed new Y. W. C. A. residence were discussed. The Board has an option on two sites on King street, west of Dufferin. The estimated cost of the building is $35,000.

Plans have been prepared by J. Hancock, architect, for a pair of two-storey semi-detached brick dwellings on Givens street for W. A. Nixon, to cost $4,000; also for a pair of two-storey brick dwellings on Westmoreland avenue for H. LeDrew. Estimated cost, $4,000.

J. H. Galloway, architect, 77 Victoria street, has prepared plans for four attached two and a half storey brick stores and dwellings on Queen street west for R. T. Smith. Estimated cost, $8,000.

Plans have been prepared by Simpson & Young, architects, 17 Toronto street, for the erection of a $12,000 residence on Broadview avenue; also for a three-storey apartment house of brick construction to be erected on King street west at a cost of $30,000.

J. W. Siddall, architect, 75 Yonge street, has prepared plans for a two and a half storey residence of brick construction to be built on Roxborough street at a cost of $20,000. The same architect has plans for a $5,000 brick dwelling on Park place for H. H. Halls.

J. Hunt Stanford, architect, has plans for residences as follows: two pair of semi-detached and one detached brick dwellings, Marguerетta street, cost $7,000; brick residence, Forest Hill road for C. Pace, cost $6,500; brick residence, Palmerston Boulevarde, for C. Baker, cost $7,000; pair of two and a half storey brick dwellings, St. Clair avenue, for R. McLeod, Walmer Road Hill; two pairs of two and a half storey brick dwellings, Howard Park avenue for J. Gibson, cost $8,000.

J. A. Harvey, architect, Manning Chambers, has prepared plans for a two storey brick residence on Major street for S. G. Near, to cost $4,500; also for a two and a half storey brick residence to be erected on Lucas street for J. S. Lougheed, cost $2,800, and for a two storey brick apartment house to be erected at the corner of Havelock street and Sylvan avenue for J. T. Hutson at a cost of $14,000.

Plans have been prepared by the Designing and Draughting Company, of 23 Jordan street, for a $4,500 brick dwelling to be erected on Indian road for T. W. Murray, also for a frame residence at Munro Park for A. Brovan, 103 Charles street.

Recent building permits include: E. M. Shildrick, pair semi-detached 2 storey brick dwellings, Major street, $8,000; G. H. Webb, pair semi-detached 2 1-2 storey brick dwellings, Lynd avenue, $4,000; Wm. Thompson, 2 storey brick dwelling, Simpson avenue, $3,000; G. E. Case, 4 detached 2 1-2 storey brick dwellings, Sunnyside avenue, $12,000; Mrs. James Taylor, 2 1-2 storey brick dwelling, Admiral road, $9,200; J. T. Turner, 2 pair semi-detached 2 storey brick dwellings, Fenwick avenue, $8,000; J. Townsend, 2 storey brick addition, to stable, Yorkville avenue, $4,500; J. T. Turner, 2 1-2 storey brick store and dwelling, corner Danforth and Fenwick avenue, $3,000; H. N. Smith, 6 pair semi-detached 2 1-2 storey brick dwellings, Wallace avenue, $30,000; J. Jones and Company, pair brick dwellings, Brunswick avenue, $5,000; G. Fordyce, 2 brick dwellings, Radford street, $4,400; J. V. Hunter, pair brick dwellings, Havelock street, $6,000; J. Fyfe, pair brick dwellings, Fern avenue, $5,000; R. M. Mackay, 3 brick dwellings, Fermanagh avenue, $6,000; Hon. Geo. A. Cox, verandah and palm house, Sherbourne street, $10,000; S. B. Hinder, 2 brick dwellings, Heath street, $5,000; S. B. Bagshaw, brick dwelling, Marion street, $4,000; Brown Bros., pair brick dwellings, Christie street, $4,000; H. McWhinnie, pair semi-detached 2 storey brick dwellings, Dovercourt road, $4,000.

Winnipeg, Man.

E. D. Little, architect, 204 Bannatyne avenue, is preparing plans for the erection of a brick residence at Crescentwood for Mr. L. A. Smart. Approximate cost $8,000.

AWARDED.

Toronto, Ont.

Chadwick & Beckett, architects, this city, have awarded contracts as follows for the erection of a 2 1-2 storey brick dwelling at the corner of Heath street and Dunvegan avenue for Mr. J. Ince: Masonry, J. C. Claxton & Son; carpentry, F. Heal; roofing, Webb & Dunlop; plastering, J. W. Nonson; painting and glazing, Faircloth & Company, Limited; plumbing, Toronto Furnace Company; heating, Joseph Harrison; wiring, R. A. Gray.

Business Buildings and Industrial Plants

Buctouche, B.C.

The buildings of J. D. Irving and B. H. Foley were destroyed by fire last week at an estimated cost of $20,000. Mr. Irving may rebuild.

Calgary, Alta.

The Dominion Meat Company has been bought out by the Morris Company, who will carry out important extensions.

Cumberland, B.C.

R. Grant & Company are taking tenders this week for the erection of a store building.

Estevan, Sask.

Kelly's hotel and the buildings owned by Arthur Kelly and others were destroyed by fire last week. Estimated total loss, $50,000.

Hamilton, Ont.

A new foundry will be erected in the spring by the Tallman Brass & Metal Company, this city.

Kenora, Ont.

Ridout & Company, furniture dealers, will shortly commence the erection of a large addition to their premises in this town.

Lumsden, Sask.

The Maple Leaf hotel was recently destroyed by fire at a loss of $18,000.

Montreal, Que.

George H. Langwell's smelting and refining works on East Dorchester street were damaged by fire last week at a loss of $3,000.

Niagara Falls, Ont.

The American Column Company, Battle Creek, Mich., will build a one storey factory building, 50 by 150 feet here, for their Canadian business; estimated cost, $25,000.

Ottawa, Ont.

Blyth's dry goods store on Bank street was recently damaged by fire.

Peterborough, Ont.

The T. Eaton & Company, Limited, of Toronto, may establish a branch here.

Rouleau, Sask.

The Conger Company's elevator at this point was destroyed by fire last week.

Sydney, N.S.

J. H. Plummer, president of the Dominion Iron & Steel Company, states that the Board is considering important extensions to the plant.

Saskatoon, Sask.

The erection of a large brick and concrete addition to George Sparling's block will shortly be commenced.

A large central site has been purchased by the A. Carruthers Company, Limited, who will build in the near future.

Toronto, Ont.

J. Townsend will build a two storey brick addition to his livery stable on Yorkville avenue at a cost of $4,500.

W. J. Morris has obtained a permit for the erection of a pair of brick stores and dwellings on Dundas street. Estimated cost $3,500.

A two storey brick store and dwelling will be erected on the northwest corner of Gladstone and Hallam avenues at a cost of $3,900.

A permit has been issued to R. Barrett for two attached two storey brick stores and dwellings on Bloor street to cost $8,700.

The Nasmith Bakery Company have obtained a permit to erect a bakery, storehouse and stables on Sterling road at a cost of $40,000.

It is stated that the Canada Cycle & Motor Company, Limited, are about ready to start the construtcion of their new three storey building on Richmond street.

Negotiations are stated to be in progress for the purchase of the property on the northwest corner of Front and York streets owned by Mr. John Macdonald. It is believed that the site is wanted for the erection of either a large hotel or an office building.

Vancouver, B.C.

Plans are being prepared for an addition to the buildings of the market wharf.

The Robertson Godson Company have obtained a permit for a building to cost $3,600.

F. W. Peters, of the C. P. R., was here last week in connection with the proposed terminal elevators.

J. Burnett, of Nanton, Alta., has purchased a site for the construction of a terminal elevator in the spring.

Parr & Fee, architects, have completed plans for MacLennan & Campbell's new block on Pender street to cost $45,000.

The British Columbia Electric Railway Company are about to call for competitive plans for the proposed new office building and terminal station corner of Hastings and Carroll streets. Estimated cost, $200,000.

Victoria, B.C.

The B. C. Soap Works contemplate large additions to their factory.

Tenders have just been taken for the building of a brick store for the Victoria Creamery Association. D. C. Frame, architect.

Welland, Ont.

It is stated that the Bemis Bag Company have decided not to build this spring.

The Page-Hersey Company will put up a tube mill and the Dain Manufacturing Company, of Ottumwa, Iowa, three factory buildings this month.

Weyburn, Sask.

The Western Fire Clay Products, Limited, capitalized at $600,000, are stated to have decided to commence operations here early this spring.

Windsor Mills, Que.

The Canada Paper Company may rebuild their plant here.

Windsor, Ont.

The Medbury building was damaged by fire last week to the extent of $5,000.

Winnipeg, Man.

The Princess Hotel Company, Limited, has been incorporated to erect a large modern hotel here.

The Security, Storage & Warehouse Company, recently organized with a capital of $100,000, will shortly enter upon the construction of two warehouses. Mr. I. M. Winslow is president and manager of the company.

Plans prepared by J. D. Atchison, architect, have been approved for a three storey office building to be erected upon the site of the old Manitoba Club on Garry street by the Canada Permanent.

AWARDED.

Montreal, Que.

The contract for the electrical work in the new Lyman warehouse has been awarded to H. H. Willetts. Mitchell & Creighton, this city, architects.

St. Louis, Que.

Contracts for the new warehouse to be erected by the Campbell Manufacturing Company, have been awarded as follows: Masonry and brick work, Lynch & Sharp, this town; georgia pine timber, Shearer, Brown & Wills, Limited, Montreal; dressed stone, C. Charbonneau, St. Louis. J. Perreault, Montreal, architect.

Victoria Harbor, Ont.

The C. P. R. have awarded to the J. S. Metcalf Company, of Chicago, the contract for the erection of a new grain elevator at this place. Approximate figure, $900,000.

Power Plants, Electricity and Telephones

Allanburgh, Ont.

Application is being made to the provincial legislature by the Niagara Peninsular Railway Company for permission to construct a branch line of railway through the townships of Humberstone, Crowland and Thorold to this village; also to increase the capital stock of the company to $200,000.

Listowel, Ont.

Tenders will be received by A. St. George Hawkins, Chairman of the Fire, Water and Light Committee, for the equipment of the municipal electric system of Listowel. The plant will include steam driven generators and both commercial and street lighting. It is proposed to install over 250 Tungsten lamps on the streets. C. H. and P. H. Mitchell, Toronto, are the consulting engineers for the town. (See advertisement.)

Midland, Ont.

The Simcoe Electric Railway & Power Company are applying for incorporation to construct an electric railway from Midland to Coldwater, Ont., also for power to issue bonds to the extent of $20,000 per mile.

Montreal, Que.

The Montreal Electric Light Company are proceeding with the erection of their distribution system in the city of Montreal and for immediate needs have closed a contract with the Saraguay Electric & Water Company for the supply of power in bulk. They expect to start construction work early in the spring on a 10,000 h.p. steam plant. This steam plant will ultimately be used as a reserve for their water powers when developed. Messrs. Wescott & Grier, of Montreal, Que., are the consulting engineers of the company.

Application will be made for the incorporation of the Kapitchouan Railway Company, for the construction of an electric railway from Lake Kapitchouan to this city, with branch lines of about twelve miles in length.

Medicine Hat, Alta.

The Southern Alberta Railway Company have obtained a charter to construct an electric railway from the main line of the C. P. R. and the Bow river to this city.

North Vancouver, B.C.

The B. C. Electric Railway Company have decided to rebuild their transmission lines, carrying them up Lynn creek. New transformers will be installed in the substation and also a new transformer giving double power to the street lighting system. Mr. A. G. Parry is local manager of the company.

Ottawa, Ont.

Application will be made to the Dominion Government for the incorporation of the Arnprior and Pontiac Railway Company. Perkins, Fraser & Gibson are solicitors for the company.

Port Arthur, Ont.

The construction of the proposed Dog Lake dam will be commenced this spring.

St. John, N.B.

The Fundy Tidal Power Company are applying to the Dominion Government for incorporation, with power to develop power from the tidal flow of certain waters emptying into the Bay of Fundy, and for this purpose to construct dams at certain points; also to carry on the business of a power and electric heating and lighting company, etc.

Trenton, Ont.

This town is making application to the provincial legislature for authority to issue debentures up to $200,000 in aid of the development of power on the river Trent.

Toronto, Ont.

A telephone system will be built by the Hydro-Electric Commission along the public highway, paralleling the course of the power transmission line and with points at every mile where connections may be made.

Vancouver, B.C.

Mr. Wm. Whyte, second vice-president of the C. P. R., is reported to have said that the C. P. R. will eventually electrify its lines in the west and a commencement may soon be made in the southern portion of British Columbia. For some time officials of the C. P. R. have had experts studying the streams in the mountains with a view to determining whether enough energy could be developed through waterpower to supply electric power. They reported that from the Rocky Mountains to the coast range the waterfall is sufficient to supply power for all the railroads in the United States.

A. Carmichael, hydraulic engineer and contractor, has inspected the water power on the site on the Powell river with a view to the development of 5,000 horse-power. A large paper and pulp mill is to be erected there by the Canadian Industrial Company.

Victoria, B.C.

If an agreement can be made with the City Council by the British Columbia Electric Company, the latter will undertake to erect a power plant with a capacity of not less than 10,000 horse-power, and make extensions to the electric railway, light and power systems in the city at a minimum expenditure of $250,000 within three years.

Winnipeg, Man.

Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until April 15th for the manufacture of two testing transformers, namely: One 30 kw. at 80,000 volts and one 200 kw. at 200,000 volts, also for control equipment therefor. Specifications and forms of tender may be obtained at the office of the Power Engineer, Carnegie Library Building, this city, or at the office of Smith, Kerry & Chace, Confederation Life Building, Toronto.

AWARDED.

The contracts for the electrical equipment of twelve of the stations on the transmission line between Toronto and Niagara Falls and St. Thomas have been awarded. Two-thirds of the equipment has been awarded to the Canadian General

Electric Company and about one third to the Canadian Westinghouse Company. This installation will provide for the supply of power to the following municipalities:—Niagara Falls, Dundas, Hamilton, Toronto, Weston, Brampton, Acton, Milton, Brantford, Paris, St. Mary's, Woodstock, Ingersoll, Norwich, Guelph, Preston, Hespeler, Galt, Berlin, Waterloo, Elmira, New Hamburg, Baden, Stratford, Tillsonburg, London, St. Thomas. In the new equipment is included a modern protective system, the first to be introduced on this continent. The equipment also provides a spare transformer for each station, and even with these additions the cost of the equipment will be some $350,000 below the estimated cost. Mr. McGuigan's tender for building the transmission line is $1,270,000, so that it will be found when the new system is completed that the commission has been well within the mark in all its estimates.

Miscellaneous

London, Ont.

Tenders for general supplies, including lumber, hardware, iron castings, corner irons, portland cement, glazed and concrete tiles, gravel, broken stone, etc., will be received until March 11th by A. O. Graydon, City Engineer.

Ottawa, Ont.

The Minister of Railways and Canals states that the government will construct the necessary repairs and improvements to the dyke along Hunrgy Bay, Lake St. Francis.

Winnipeg, Man.

Tenders addressed to J. T. Blackwood, Secretary, Public Parks Board, will be received until March 4th for 250 yards of gravel.

Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until March 8th for supply of street cleaning machines. Specifications at office of Street Commissioner, City Hall.

AWARDED.

Hamilton, Ont.

The following contracts for supplies have been awarded by the Board of Works:—Lumber, W. J. McAllister, $26.45; asphalt, California Asphalt Company, $26 a ton; gravel, E. New, at prices twenty per cent. lower than paid last year. L. H. Gibb, Buffalo, tendered at $25.75 a thousand for paving brick, and the United States Block Company at $1.75 per square yard for wood blocks, but these contracts were not let.

Montreal, Que.

The Wm. G. Hartranft Cement Company, Limited, of Montreal, have obtained a contract from the Department of Railways and Canals for 46,000 barrels of "Vulcan" cement for use on the Quebec and Lachine canals.

Ottawa, Ont.

Contracts for city supplies for the current year have been awarded as fololws: Vitrified clay pipe--Hyde & Webster, $3,947; T. S. Kirby, $3,263; McKinley and Northwood, $3,617; Wright and Company, $3,473.50; Ottawa Fireproof Supply Company, $3,698. Mr. Kirby's tender was accepted. Reinforced concrete culverts—Dominion Concrete Company, 95 cents for 24 inch and 65 cents for 8 inch size. Planks and cedar—W. H. McAuliffe, $7,790; E. C. Grant, $8,076; Gow and Baylis, $8,335. Mr. McAuliffe's tender was accepted. Sand—Dupuis and Son, 88 cents per yard; George Farmer, 97 cents; Powell Sand Pit, 89 1-2 cents; W. J. and J. H. Spratt, 93 cents; J. R. Irwin, 90 cents; Joyce and Son, 95 cents; Brooks and Couch, 95 cents. Dupuis' tender was accepted. Cement—International Portland Cement Company, 44 cents per hundred pounds. Broken stone—T. S. Kirby and Company, $12,070; Fleming, Dupuis Company, $11,890; Ottawa Stone Company, $12,350; Wright & Company, $12,420. The tender of the Fleming Dupuis Company was accepted. Castings—Thomas Lawson, $2.48 per hundred pounds. Accepted. Brick—James R. Irwin, $9.50 per thousand; Supply Company of Ottawa, $10; Silica Brick Company, $9.50. The tender of Mr. Irwin was accepted but the engineer was instructed to purchase a number of silica bricks and give them a test on certain works. For six street sprinkling carts—Ottawa Car Company, $374 each for steel tanks; Geo. Heaman, London, $310 each (wooden tanks); Preston Car and Coach company, $333 each, steel tanks. These tenders after some discussion were laid over till the estimates are prepared.

Prescott, Ont.

The contract for the submarine rock excavation and dredging for improving the middle channel in the river St. Lawrence between Brockville and Kingston, has been awarded to Frank Gilbert, president and managing director of the Gilbert Bros. Engineering Company, Montreal, contractors for the Galops Rapid Works in the St. Lawrence.

Winnipeg, Man.

The Canadian Rubber Company obtained the contract for supply of rubber belting at $649.93.

J. L. Neilson & Sons have the contract for supply of rubber belting required at the city quarry at $439.

New Companies

Perfect Skewer Company, Limited, West Toronto, Ont., incorporated to manufacture lumber and builders' supplies, etc., capital, $40,000. Incorporators, S. W. Hopper, D. Kennedy, R. E. Black, G. D. Kemp, C. E. Proctor and A. J. Anderson, all of West Toronto.

Nasmith Baking Machine Company, Limited, Toronto, Ont., incorporated, capital $100,000. Incorporators, J. D. and S. J. Nasmith, A. H. Rodgers, S. Turner, jr., and W. E. Archer, all of Toronto.

Northern Dredging Company, Limited, Durham, Ont., incorporated to carry on a general dredging business and to take contracts for all kinds of harbor improvements, capital $199,000. Incorporators, R. H. McWilliams and C. R. Lavelle, both of Durham; V. Ratz, Parkhill, Ont., and S. G. McKay, Woodstock, Ont.

Lennox Telephone Company, Limited, Hay Bay, Ont., incorporated, capital $4,,000. Incorporators, I. Hambly, J. J. Clark, P. Seeley, S. W. Spencer and G. H. Smith, all of the Township of North Fredericksburg; and others.

Rixon, Ainslie, Stoddart Company, Limited, Owen Sound, Ont., lumber manufacturers, incorporated, capital $200,000. Incorporators, H. Rixon, J. G. Ainslie and W. Stoddart, Owen Sound.

McBurney Lumber Company, Limited, Toronto, Ont., incorporated, capital $50,000. Incorporators, J. McBurney, C. H. Edwards, R. C. Davidson and others, all of Toronto.

Western Terminal Elevator Company, Limited, Winnipeg, Man., incorporated, capital, $500,000. Incorporators, R. Siderfin, A. H. Campbell, F. D. Dilts, W. M. Graham and G. D. Munro, all of Winnipeg, Man.

Smith Hardware Company, Limited, Montreal, Que., incorporated, capital $20,000. Incorporators, D. G. Cmith, A. R. Hall, S. W. Jacobs, K.C., and others, all of Montreal.

Novelty Woodworking Company, Limited, St. John, N. B., incorporated, capital $20,000. Incorporators, H. R. Ross, J. H. King, H. E. Figsby, A. C. Crawford and R. R. Boyer, all of St. John, N. B.

G. A. Grier & Sons, Limited, Montreal, Que., incorporated to acquire the lumber manufacturing business of G. A. Grier & Sons, capital $500,000. Incorporators, G. A. Grier, G. W. Grier, D. G. Wardrope, A. H. Grier and others, all of Montreal.

H. W. Petrie of Montreal, Limited, Montreal, Que., incorporated to manufacture all kinds of machinery and to take over the business of H. W. Petrie, Limited, capital $40,000. Incorporators, W. Laurie, T. P. Altimas, M. A. Phelan, all of Montreal, Que.; A. W. Royan, of Westmount, Que.

Montreal Wire Bound Box Company, Limited, Montreal, Que., incorporated, capital $100,000. Incorporators, A. J. Brown, K.C., R. O. McMurty and F. C. Bush, all of Montreal.

Hull Wooden Ware Company, Limited, Hull, Que., incorporated, capital $40,000. Incorporators, E. J. Taber, A. McConnell, W. C. Wainwright, all of Hull, Que.; D. Diver, of Deerfield, Mich., and others.

Brantford Foundry and Development Company, Limited, Brantford, Ont., incorporated, capital $40,000. Incorporators, W. B. Burrill, J. B. Rouse, J. Moffat and J. Burns, all of Brantford, Ont., and others.

Maryborough Telephone Company, Limited, Moorefield, Ont., incorporated, capital $10,000. Incorporators, A. Malcolmson, P. Richardson, A. C. Munns, J. Paterson, F. Tait and C. Mannell, all of Moorefield, Ont.,and W. Colquhoun, of Maryborough Township.

Cobalt Electric Power Company, Limited, Toronto, Ont., incorporated, capital, $500,000. Incorporators, F. W. Baillie, S. Johnston, A. J. Thomson, R. H. Parmenter and W. N. Tilley, all of Toronto.

Sanders & Bell, Limited, St. Thomas, Ont., incorporated as carpenters, contractors, and builders, and to manufacture and deal in woodenware, building materials and lumber, capital $40,000. Incorporators, A. R. Sanders, F. C. Bell, E. C. Sanders and others, all of St. Thomas, Ont.

H. L. Bowers, Limited, Port Hope, Ont., incorporated to manufacture and deal in building, foundry and sanitary supplies, capital $40,000. Incorporators, H. L. Bush, A. E. Pipher, H. L. Bowers, all of Port Hope, Ont., and others.

Don Valley Brick Company, Limited, Toronto, Ont., incorporated, capital $500,000. Incorporators, J. M. Bowman, G. T. Davies, R. W. Davies and others, all of Toronto.

Business Notes

J. M. Walkley & Company, electrical engineers, Montreal, Que., have registered.

The assets of E. S. Manny & Company, engineers, Montreal, Que., will be sold on March 4th.

S. Hill & Son, lumber manufacturers, Saskatoon, Sask., have been succeeded by the Hill Manufacturing Company.

The Home Stores, Limited, capitalized at $200,000, have been incorporated to carry on a general lumber business in British Columbia.

Tenders and For Sale Department

Canadian Agents Wanted

A British firm manufacturing Tiles, Mosaics, Faience, Terra Cotta, etc., wants Canadian agents in Toronto, Winnipeg, Montreal and other large cities. Correspondence confidential. Box 140 CONTRACT RECORD, Toronto. 12

Business For Sale

An electrical contracting business in good Ontario city is offered for sale. Good local connection. Owner has another proposition in view. Address Box 141, CONTRACT RECORD, Toronto. 10

Draftsman Wanted

Capable, reliable architectural draftsman accustomed to high class work. Full particulars as to experience and salary to

HERBERT E. GATES, Architect,
Telephone Building, Halifax.
10

Applications Wanted

Applications will be received at the office of the undersigned and marked "Application for City Engineer" up to and including TUESDAY, THE 23RD OF MARCH, 1909, until 5 o'clock p.m.

J. H. TRUSDALE,
City Clerk.

Saskatoon, Sask., Feby. 15th, 1909. 10

Temiskaming and Northern Ontario Railway Commission

Sealed tenders addressed to the undersigned and marked on the envelope "Tender" will be received up to 12 o'clock noon on WEDNESDAY THE 17TH MARCH for the following works:—

1. **Engine House and Machine Shop at Cochrane.**
2. **Locomotive Foreman's Office and Petty Stores Building at Cochrane.**
3. **Heating Plant for Cochrane Roundhouse and Machine Shop.**
4. **One 75 ft. Turntable complete at Cochrane.**
5. **Coal Shed and Trestle at Cochrane.**
6. **Culvert near Mileage 22½.**
7. **5 ft. Arch Culvert near Mileage 50¾.**
8. **20 ft. 1 Beam Span near Mileage 62½.**
9. **20 ft. re-inforced Concrete Arch Culvert near Mileage 222½.**
10. **One 8 ft. re-enforced Concrete Arch Culvert near Mileage 221.**
11. **One 11 ft. re-enforced Concrete Arch Culvert near Mileage 218½.**

Plans and specifications may be seen at the office of the Secretary-Treasurer, 25 Toronto St., Toronto, or at the office of the Chief Engineer, North Bay.

Forms of tender and amount of deposit necessary in respect of each item can be obtained on application to the Secretary-Treasurer at above address.

Lowest, or any tender, not necessarily accepted.

A. J. McGEE,
Secretary-Treasurer.

25 Toronto St., Toronto,
February 22nd, 1909.

Papers inserting this advertisement without authority will not be paid for same. 11

City of Prince Albert

Tenders

"Tenders for Road Machinery" will be received unti 8 p.m. on THURSDAY, MARCH 18TH, for the following:

1. 1 Stone Crusher.
2. 1 Elevator and Screens.
3. 1 Electric Motor.
4. 1 Steam Road Roller.

Specifications and other information will be forwarded on application to F. A. Creighton, Esq., City Engineer, Prince Albert, Sask.

C. O. DAVIDSON
Secretary-Treasurer
9

Tenders

Listowel Electrical System

Listowel, Ontario

Tenders will be received by A. St. George Hawkins, Esq., Chairman, Fire, Water & Light Committee, Listowel, Ontario, up to noon of MONDAY, MARCH 8TH, 1909, for Boiler, Engines, Generators, Switchboard, Distribution and Street Lighting Material, etc.

Lowest or any tender not necessarily accepted. Specifications may be obtained from

CHARLES H. MITCHELL
PERCIVAL H. MITCHELL
Consulting and Supervising Engineers
1005 Traders Bank Building, Toronto
9

Tenders for

Palm House and Boiler House

in the Allan Gardens, Toronto

Bulk Tenders or tenders for the several contracts mentioned below in connection with the above buildings, will be received by registered post only, addressed to the undersigned, up to noon on

Tuesday, 16th March, 1909

Contract No. 1—Excavating, weeping drains, concrete, brick work, cut stone work, tile work, grading and other work.

Contract No. 2—Carpenter work, iron and steel work, galvanized iron work, ventilating apparatus, painting and glazing, and other work.

Contract No. 3—Felt and gravel roofing

Contract No. 4—Plastering.

Contract No. 5—Plumbing.

Plans and specifications may be seen and forms of tender and all information obtained at the office of the City Architect, Toronto.

Envelopes containing tenders must be plainly marked on the outside as to contents. The usual conditions relating to tendering, as prescribed by City By-law, must be strictly complied with or tenders may not be entertained. The lowest or any tender not necessarily accepted.

JOSEPH OLIVER (Mayor)
Chairman Board of Control.

City Hall Toronto Feb, 23rd, 1909 9

Wanted

Good practical man familiar with the manufacture of cement blocks, tile and other cement products. State experience salary and give references. Apply P. O. Box 1030, Brockville, Ontario. 10

Town of Weyburn

Province of Saskatchewan

Tenders Wanted

Sealed tenders will be received by the Secretary-Treasurer of the Town of Weyburn until

8 p.m., on Wednesday, April 7, 1909

for the following sections of proposed System of Water Works:—

"A" Pipelaying
"C" Water Tower
"D" Cast Iron Pipes
"E" Fire Hydrants and Valves

Plans and specifications may be seen at the office of the Secretary-Treasurer, Weyburn, or at the office of the Chief Engineer, Toronto, on or after March 8th.

SAMUEL MURRAY, Esq.,
Chairman W. W. Committee,
Weyburn, Sask.

J. R. FOX, Esq.,
Mayor,
Weyburn, Sask.

GEORGE ROSS, Esq.,
Secretary-Treasurer,
Weyburn, Sask.

WILLIS CHIPMAN, C.E.
Chief Engineer.
103 Bay St., Toronto, Ont.

10

Village of Burlington

Province of Ontario

WATER WORKS

Tenders Wanted

Sealed tenders will be received by the Village Clerk until

8 p.m. on Tuesday, March 23, 1909,

for the following sections of the proposed Water Works System:

"A" Pipelaying.
"B" Pump House.
"C" Water Tower.
"D" Cast Iron Pipes.
"E" Hydrant Valves.
"G" Electrically Operated Pumping Machinery.
"I" Pump Well.

Plans and specifications for "A", "C", "D" and "E" may be seen at the office of the Clerk, Burlington, or at the office of the Chief Engineer, Toronto, on or after March 1st.

M. C. SMITH, Esq.,
Reeve,
Burlington, Ont.

O. T. SPRINGER, Esq.,
Clerk,
Burlington, Ont.

WILLIS CHIPMAN, C.E., Chief Engineer,
103 Bay St., Toronto, Ont.
9

G. W. Green, Peterborough, Ont., manufacturer of machinery and pumps, has been succeeded by the G. W. Green Company, Limited.

ESTABLISHED 1886

Contract Record

In which is incorporated

Architect & Builder

A National Journal of Architecture, Building, Engineering, Public Works, Tenders, Advance Information and Municipal Progress.

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D. BURNSIDE, Representative

WINNIPEG - - Telephone 224. 404 Travellers' Bldg.
ROLAND F. HILL, J. R. HOOPER, Representatives

VANCOUVER. Telephone 2010. 26 Crowe & Wilson Chambers
GEO. A. GALL, Representative

SUBSCRIPTION RATES.

Canada and Great Britain	$2.00
United States and Foreign	2.50

Vol. 23 Toronto, March 3, 1909 No. 9

A Plea for Better Recognition of the Services of Builders

President Dinnis, of the Toronto Builders' Exchange, brought up a matter in his speech at the annual banquet of the Exchange last week, which at first glance might not seem of serious importance, but which nevertheless will bear a good deal of discussion. Mr. Dinnis was impelled by the apparent lack of appreciation on the part of the public for the work of those who erect their buildings, to suggest that it would be a good thing if the builders of the more important structures in the city were allowed to place their names upon them when completed. It seems almost a childish ambition at first, but upon second thoughts there is much to commend it. It is a suggestion which was born, not of any selfish desire to have one's name emblazoned abroad, but as the result rather of a natural pride in the achievement of good work.

By his works a man must be known, and surely this should be the case with those who erect buildings, more almost than in the case of any other class of workmen. When a man makes himself famous as an orator his name is handed down to tradition in the pages of history. If he becomes famous as a painter or sculptor the annals of his profession bear his name in honor before succeeding generations, but if he is the humble builder of dwellings wherein men may live and work, and enjoy that measure of comfort which is essential to the performance of their work, his deeds are forgotten and his achievements are moulded into a sort of collection, which typify only the works of a particular period, without consideration of the person who performed them. This is one of the injustices which are so numerous in the working out of our civilization and which could be remedied without any serious overturning of accepted ideas.

It would be fitting that those who have assisted in the creation of a great building should have their names commemorated in some manner, and no method would be more suitable than that they should be inscribed upon the building. If a man knew that his name would be forever engraved upon the face of a building upon which he was engaged he would surely take a little more interest in its erection than he could possibly take if all he was interested in was its completion according to specifications. He would feel, for instance, that the tests of time would be added to those ordinarily required by the architect. In the supplying of materials he would feel it his duty, more completely than otherwise, to see that none but those which would stand the wearing, warping and expanding influences of atmosphere, temperature and moisture were used. Materials which wear away quickly or which crumble or warp and result in cracked walls or draughty windows would never be used.

It is rather a pessimistic view of matters to take, that a builder needs the stimulus of posterity's applause to urge him to his best work, but it is a human view nevertheless and applies to every field of work. There have always been scamps in every line of business since the world began, and there always will be, but there would be fewer of them in the building business if it were assisted by some such custom as this. There would be a much greater interest for those who are honestly seeking to perform their work well, but who, like other human workmen, are liable to lost interest if their achievements are never properly appreciated. It is not in the elimination of scamps that such a custom would do good, but in the elevation of the general standard of workmanship. It might do much also, to improve the attitude of the public towards builders and contractors and might help to relieve them of that stigma, in many cases far from just, which attaches to their calling and which leads the unthinking public to class contractors, without distinction, as men who always seek their own temporary advantage to the detriment of those whom they serve.

Raising the Status of the Building Trade

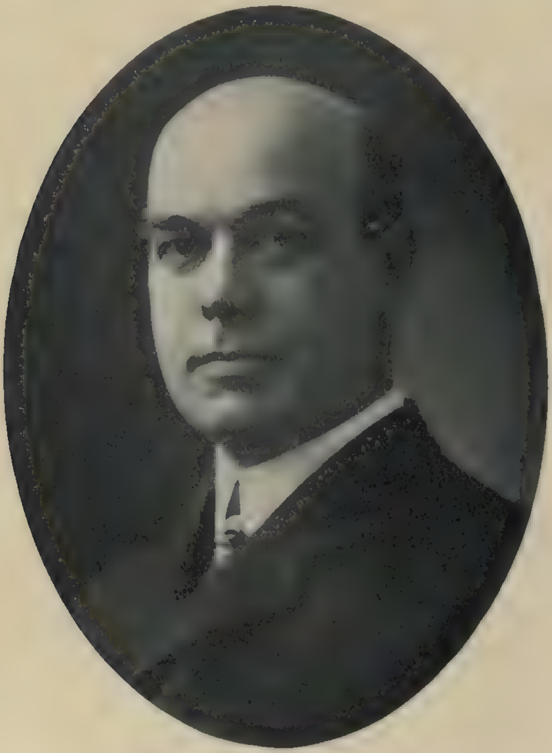
The Builders' Exchanges in this country are very excellent institutions and a very present help to the trade generally, but it would seem that there are yet a few ideas from over the border worthy of adoption. A spirit worthy of emulation in Canada has been shown by the Minneapolis Builders' Exchange in the placing of a room at its headquarters at the disposal of employees, where good reading and a place to sharpen tools are provided. The teaching of drafting to carpentry apprentices and purposed instruction in plumbing are also the outgrowth of this co-operation with the journeymen.

One of the speakers at the annual banquet of the Builders' Exchange of St. Paul, when this subject was discussed, brought forward another admirable idea when he urged that the local exchange should join hands with the newly organized Municipal Art Association in its efforts to improve the architectural beauty of the public and private buildings that will be erected in St. Paul in the future. Canadian builders, also, should seek the best that art may suggest for their plans, and endeavor to raise the standard of their employees by helpful provisions of an educative character. The secret of the elevation of status is education, although this may sound something like a well worn axiom. In this axiom, however, there is much import. Strive to learn, learn to teach, aim to elevate. In so doing a builder will do much towards making a success of his own individual business and a little for the whole trade.

Hamilton's New City Engineer

Mr. Andrew F. Macallum, C.E., who will shortly take up the duties of City Engineer of Hamilton, Ont., is a Toronto man, having been born and educated in this city. He is a graduate of the School of Practical Science and Toronto University, obtaining the degree of B.A.Sc. in 1894. In addition, Mr. Macallum holds the professional degree of C.E., and is a member of the Canadian Society of Civil Engineers.

Mr. Macallum's experience has been wide and varied, covering many important projects throughout the Dominion. Municipal and consulting work might be said to have always been his fortes. From the outset of his career Mr. Macallum has been connected with responsible projects. He was engineer-in-charge of the waterworks at Midland, Grimsby and Bridgeburg and of sewers at Midland. From the office of the late W. T. Jennings, who was at that time City Engineer for Toronto, Mr. Macallum was in 1893 appointed assistant to the York County Engineer.



Mr. A. F. Macallum, C. E.

As a consulting engineer Mr. Macallum has always been in great demand. A few of the undertakings upon which he has been engaged to report and estimate include: Viaduct for Toronto, Bracebridge & Trading Lake Railway; Eastern Entrance Railways, Toronto; entrance of electric railways, Hamilton; Chicago & Milwaukee Electric Railway; Windsor, Essex & Lake Shore Railway. He was consulting engineer for West Toronto, and arbitration engineer for the Canadian Northern Railway. Mr. Macallum was at one time called to Alaska in the interests of the Alaska Central Railroad. Another specialty of Hamilton's new city engineer is water power. Mr. Macallum has made reports in connection with power development on the Ottawa, Seine, Madawaska, Black, Grand and York rivers, and on the Welland and Des-Jardines canals.

In railroad work also Mr. Macallum has a capital record, having been resident engineer for the Toronto, Hamilton & Buffalo Railway; Minneapolis & St. Louis Railway; Chicago & Great Western Railway, and for the reconstruction of the C.P.R. at Ottawa. He was also chief engineer of the Nipissing & Northern Railway; Hamilton, Grimsby & Beamsville Railway, and Great North-West Central Railway, and division engineer of the Transcontinental.

Mr. Macallum is now working in conjunction with Mr. T. Aird Murray, C.E., in the Continental Life Building, in the solution of sewerage and sewerage disposal problems. It is gratifying to learn that the municipal position will not interfere to any great extent with this private practice.

Mr. Macallum is leaving this week for Europe and will remain there for about two months, returning to take up his new duties early in May.

Builders' Exchange Annual Banquet

The Toronto Builders' Exchange held their 18th annual banquet on Thursday of last week, and it was one of the most successful events in the history of the exchange. Mr. A. Dinnis, president of the institution, occupied the chair, and there were about one hundred members and guests present. Among the guests of the exchange were Dean Galbraith, of the School of Practical Science; Rev. A. L. Geggie, Rev. Wm. Hincks, Mayor Oliver, G. W. Gouinlock, Eden Smith, W. D. McPherson, M.P.P.; S. Harris, Joseph Russell, M.P.; Fred Armstrong, George Evans, of the Dominion Bridge Company; James Thompson, representing the Painters' Association, and Mr. Joseph Wright.

The after-dinner speeches were both interesting and practical. The toast list was opened by the toast to the King, after which Mr. W. J. Hill in a brief speech proposed a toast to the building trade of Toronto. The reply was made by President Dinnis, who covered a number of points of interest to those present. In the course of his remarks he laid particular stress upon the point that, to his mind, the builders in Toronto were not given as much credit as they deserved for their work. In the first place, they did not give themselves a proper amount of credit. The public naturally followed suit. He suggested that the builders' names should be placed on the more important buildings of the city in order that generations yet to come might know who had constructed them. There was quite as much reason for such a practice as for the placing of the architect's name and the names of the city councillors upon the City Hall at Toronto. Mr. Dinnis looked hopefully upon the coming year and expressed an opinion that it would be a very successful one for the building trade.

The toast to Canada was replied to by Mr. W. D. McPherson, M.P.P., who delivered an interesting address in which he referred with much appropriateness to the great growth which has occurred in Canada, and particularly in Toronto.

The toast to the city of Toronto was replied to by his Worship, Mayor Oliver, who dwelt particularly upon the need for beautifying the city. Some of the streets of Toronto were much too narrow and the time would come before long when they would have to form some scheme to widen them. It would cost a great deal to do this, but if the work were delayed for ten or fifteen years it would probably cost much more. Toronto was extending very rapidly and was adding a city as large as Hamilton to its size every two or three years. The builders of Toronto had practically to face a problem of building a city every year. Mayor Oliver outlined a few proposed works of much importance to the city. He hoped within the next two or three years to see a viaduct built along the water front. In a few months they would receive plans for the viaduct from the railways, and if they were at all reasonable he believed the work would be gone on with. The trunk sewer was about to be built and an electrical plant would also soon be constructed. He hoped soon to see the day when there would be a drive along the water front to the Humber and up one side of the Humber and down the other, and also to see the city extend to East Toronto, and north of Danforth Avenue. When this had been brought about Toronto would be no mean city.

Mayor Oliver mentioned an interesting fact regarding the automobile show. The manager of the White Steam Car Company had been so favorably impressed with Toronto that he had decided to open a warehouse in the city, and he had already rented a house and intended to become a citizen of Toronto. This sort of thing was going on all the time. A concern from Pittsburg, for instance, was coming to Toronto to manufacture enameled baths. The indications were that Toronto would soon be the most important educational, manufacturing and financial centre in the Dominion of Canada, and along with that he hoped to see it made the most beautiful city on the North American Continent.

The toast to the Ontario Association of Architects was replied to by Mr. G. W. Gouinlock. Dean Galbraith replied to the toast to the Canadian Association of Civil Engineers. A number of interesting speeches were also given by several of the guests, among them being Messrs. S. Harris, Rev. A. L. Geggie, Joseph Russell, M.P., Rev. William Hincks, and Fred Armstrong. Mr. Joseph Russell made a plea for the use of brick in the Toronto trunk sewer.

A number of musical selections were given which added to the pleasure of the evening. The banquet was concluded by the singing of "Auld Lang Syne."

Construction of Chimney Stacks

After the walls of a building have been built up to the wallheads, the next consideration is the erection of the chimney stacks, which may be of various forms of construction. Those chimney stacks of an irregular plan can be bonded in a better manner than those of a common form, and have often been found to be much stronger. When carried up smooth and almost straight, without any bending or contortion in any part, a flue 9 by 8 inches may be considered sufficient for a stove or any ordinary hot air furnace, and ample for an open fireplace of medium size. Still there is danger of some obstruction occurring, so that it is advisable to adopt 8 by 12-inch flues, where it is at all practicable.

Movements and Strains.

The settling of chimneys is of great importance. It is nearly certain that there will be an unequal movement between the chimney and the house. When the chimney is built upon a ledge or some immovable foundation, the roof will be sure to settle a little because of the natural shrinkage of the wood construction. On the other hand, more frequently the chimney, because of its isolated foundation, and the general shrinkage of the mortar joints, will be found to have settled more than the roof. By reason of this, as well as the danger from fire, there should be no direct attachment of any part of the roof timber. Chimneys should be, and usually are, built entirely free, and are secured to the frame by strap-iron ties, which can be so made as to bend freely to adjust themselves to any settlement, either of the chimney or of the frame.

In those cases of outside chimneys, where protection from the weather is necessary, this natural movement between the chimney and the house must be taken account of, and the chimney should be constructed with a projection of brick in line with the frame, so that the boarding may extend over and break the joint. If the top of a chimney stands clear above the house for more than ten or twelve feet, it should be stayed to the roof with iron rods. Two rods should be used, and placed as far apart as possible at the point of junction with the roof, to give a certain amount of lateral support to the chimney.

Lead for counter flashing is sometimes supplied for the mason to build into the joints of the chimney above the roof boarding. Precautions should be taken to see that the pieces are of good size, and that they are properly cemented into the brick or stonework. They should be at least six inches above the roof, and should be turned down over the flashings, which the carpenter will build in with the shingles.

Chimney Caps and Tops.

The stone caps for the tops of the chimneys should be carefully measured on the ground, to ascertain that they are the proper size, and that the holes for flues are large enough, and of the exact size, and in the right place. If the chimneys are large and have thick walls, it is necessary to make the stone cap in pieces. When this is done the stone should be properly bound together with galvanized or composition clamps.

One thing that should be avoided is the excessive projection of bricks to form the chimney top, and no more than one-half to three-quarters of an inch to each course should be allowed. It is advisable that the projection from the shaft of the chimney should be protected on top by a weathering of Portland cement; where an outside chimney is reduced in size, the weatherings should be of stone.

Although it is preferable in brick chimney stacks to have the outside work 9 inches thick, in order to keep out both the rain and the cold, which may affect the draft, yet more frequently the outside work is only 4½ inches thick.

Bonding Chimney Stacks.

In the bonding of chimney stacks, the desired end to be kept in view is that the withes between the flues shall be tied in, so as to strengthen what otherwise might prove a very weak construction. When the flues are surrounded with 9-inch brick work, either English or Flemish bond may be adopted. The great difficulty occurs with 4½-inch work; up to the present a broken kind of bond, termed "chimney bond," in which the withes are indifferently tied, has been adopted. In this bond a whole stretcher is used upon the quoin. Now by sacrificing the small amount of extra strength obtained from the use of the stretcher upon the quoin, and substituting a three-quarter bat instead, the work may be built either in English or Flemish, and an excellent tie and bond be secured.

According to some strict building regulations, the chimney shaft or smoke flue must be carried up to a height of not less than 3 feet above the roof, flat or gutter, adjoining thereto. This measurement is made from the highest point in the line of junction with such roof; also the highest six courses of every chimney stack or shaft must be built in cement.—"American Carpenter and Builder."

The Manufacture of Brick and Tile on One Plant

How it may be Practicable and Profitable—Also Details and Costs

The writer has been asked the question: "Would it be practical, as well as profitable, to make brick and tile on the same plant?" In writing an article on this subject, I will explain how I took a brick plant and carefully demonstrated this.

Looking over the brick plant, I found the following: One 100 h.p. boiler, one 60 h.p. engine, one combined brick and tile machine, one 4-roll crusher with a hand cut-off table for cutting brick; one forge; drill press; one set of pipe dies; horse and cart; a building 100x50 feet, which was used as a drier, the brick being trucked from machine to this room, and hacked off two over two, upon a slatted floor with 1-inch pipe laid 6 inches apart beneath it, 8 brick high, and four 28-foot down-draft kilns. This completed the outfit for making brick.

Upon examining the clay bank, the clay was found to be of a calcium formation, with about a 3-foot layer of red clay with the soil; the top stratum having been thrown aside, nothing was used in the making of brick but the blue clay. The fact that the only plant was six miles from this location, and tile was selling at a good price, suggested to me the manufacture of tile.

Seeing at a glance that the drier was an impractical and expensive one, I though a new one would necessarily have to be installed, so I estimated the cost of material, labor, etc., that would take care of a capacity of 25,000 brick per day, and submitted the cost to the firm. The necessary materials for constructing a steam driver were ordered to be shipped immediately.

Having 12 handy men on the plant, I saw they would be needed to do the work, and it was at once laid out.

The walls were built 5½ feet above the rails, 22 feet wide over all, and 130 feet long, running parallel with the brick machine, with a space of 30-feet 6-inches between the walls for the tracks, and a pitch of 15 inches so as to allow an easy gravitation for the cars. An 8x8 timber, anchored on top of the tunnels, was used for the walls. The two outside walls were 12-inch walls, and the outside 4-inch work was laid with lime mortar.

The inside partitions were 8-inch walls, laid up with mud. These were run up 1 foot high. The 4x6x12 pieces were laid end to end with a 2-foot centre, extending out 3 feet beyond the outside wall to be used as a return track to the brick machine. The ties, so laid, gave a rigid foundation for the rails to lie on.

The question came up, "What would be a practical covering for the tunnels?" I decided upon a hollow block, and went to work and made a cross-bar and put on a wooden plug covered with tin 1¼-inch x 6-inch, in a brick die. This was placed in the machine so that the plug came flush with the face of the brick die. Twenty-five hundred of these block were made and placed in the drying room on end, for the purpose of drying, the same requiring three days.

As soon as the drying was completed, the block were taken and placed on top of green brick that were left over in one of the kilns.

In order to get the best results from the clay that would be adapted to the making of tile, the red and blue clay was mixed up in different proportions, and I determined upon the burning to bring out the color desired

While these block were burning, the work of building the tunnels was being carried on, and the 6,500 feet of pipe from the old drier were being installed in the new. With the addition of 6,500 feet of new pipe, there was a total of 13,000 feet used in the tunnels.

In order that the reader may obtain some practical ideas from the installation of pipe in the tunnels, I will go into the subject in detail There were five pieces of 6-inch pipe 3½ feet long, connected with a 6-inch valve, between each tunnel, so that each could be dried separately if desired; also a 2-inch pipe was connected into the header to let in the live steam.

The 1-inch pipe was tapped into the 6-inch 3 inches apart. Twelve of these were laid longitudinally on the ties in the tunnels, with a ¼-inch rod laid 6 feet apart for the pipe to rest on, to take off the friction, while the pipes were expanding. Four pipes were hung on hooks 6 inches apart on each side, making a total of 2,600 feet of inch pipe in each tunnel. These were connected to a 5-inch header at the end of the tunnel, resting on two rollers.

The condensation was carried out of the 5-inch header and connected with a piece of steam hose for the expansion joint, and with a 2-inch pipe to the engine room with an automatic pump.

This was capable of taking care of a condensation of 12,000 feet. It was found that by having the pipe in each tunnel connected up separately, no trouble was experienced with leakage in the pipes, although the expansion was 5 inches in 130 feet.

The block for the room were laid on 1-inch split pipe across the tunnel, and were covered with a gravel roof. An 8-inch stack, 8 feet high, was set over every car, each stack having a slide damper, also a cap on it. These stacks were held intact with ¼-inch wire, used as a guy line, which was fastened to the pipes that the block were set on. This completed the drier.

Upon examining the block after being taken from the kilns, those that were made up entirely of red clay showed a shrinkage of 4 inches in length, color being very dark red and somewhat warped and glazed. Those containing ½ red and ½ blue had shrunk 2 inches, color dark, reddish gray, and somewhat brittle. The block of ⅛ red and ⅜ blue, showed a shrinkage of 2 inches, color a medium reddish gray, with a good hardness and metallic ring to them. This seemed to be the desirable mixture.

The making of tile was commenced, and 8,000 tile, 3-inch size, were placed in the drier, for the purpose of drying, same requiring 30 hours. In examining the tile, they were found to be somewhat checked and cracked, showing that the heat had been applied too fast before the tile had been warmed through. To do away with this cracking and checking, the dampers in the stacks were closed until the thermometer showed a temperature of 160 degrees and the tile were thoroughly warmed and started to dry from the centre out, which is essential in drying all kinds of clays. The temperature was gradually raised until 210 degrees was reached, the time of drying being reduced to 24 hours, and the checking was eliminated. One and a half tons of coal were consumed in the drying.

Different sizes of tile were made until the kiln was filled, which required five days in burning.

After a steady run of four months, an average of $75 of different sizes of tile per day being made and sold, we decided to make tile all winter. The clay was plowed up, partially dried and hauled in, which added a little cost to the manufacture, but well paid in the end.

Following is an itemized cost of constructing the drier:

72,180	brick for walls	$253.00
143	pieces 4 x 6 x 12	48.00
	Hollow block 4 x 8 x 24	40.00
	Lumber for stack	42.00
6,500	feet pipe at 5c. per foot	325.00
	Cost of rails	195.00
30	square gravel roofing	75.00
	Lumber and labor for 10 doors	20.00
	Lumber and labor for racks	50.00
	Strap hinges for doors	3.00
100	second-hand cars	500.00
	Laying brick	216.00
	Installing pipe in tunnel	75.00
40	feet 6-inch pipe	60.00
	Automatic pump	100.00
	Automatic tile cutter	75.00
200	feet portable track	48.00
12	barrels lime	12.00
	Keg 2½-inch spikes	3.00
		$2,140.00

By making this expenditure the plant was able to run steadily, and was put on a paying basis.—A. L. Thomas, in "Brick."

Construction of Concrete Steps

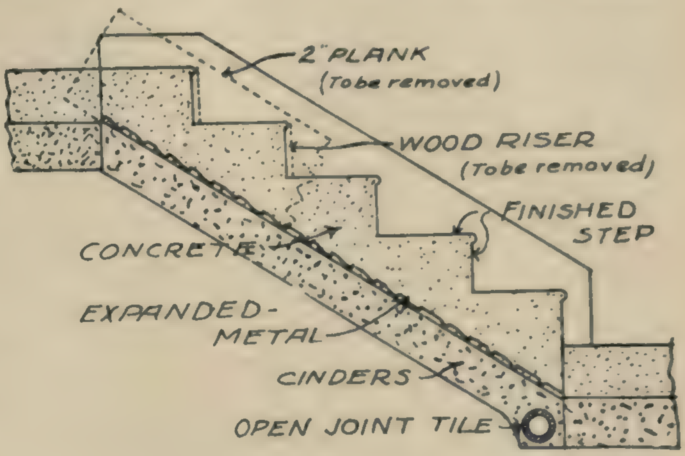
One of the most important of the many forms of concrete construction, and one that the majority of workers are called upon very frequently to deal with, is that of concrete stairs or steps. These usually occur in connection with cement walks, carrying the walk from one level to another over uneven or terraced ground. They are of many sizes, shapes and designs—ranging all the way from the straight, narrow, single step in the back kitchen walk to get down to the ash barrel level, up to the long and broad, gracefully curved, imposing flight leading up to a nation's capitol. And both these uses are served equally well!

Concrete stairs and steps are of two classes, those of the monolithic or one-stone form, and those that are moulded in pieces separately and then put in place. The former are the more common. There are many opportunities—in the grounds about country residences, for example—for building this form of concrete steps to advantage, adding much to the general appearances in each case.

Before going into the mechanical problems of the work the proper proportioning of treads and risers should be considered. The risers, the edge or vertical section of a step, should not be less than 6 inches or more than 8 inches, while the tread, the top of the step, may vary from 10 to 14 inches. Where it is intended that more than one step may be taken on a tread a width of 30 inches should be provided. This, of course, would be in a series of steps out of doors, as on a terrace or hill.

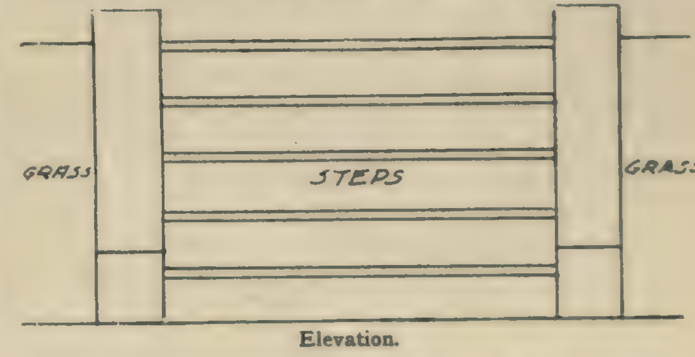
The foundations for all steps should be extended below the frost line, or have a porous base with a drain situated at the lowest point to allow the water to run off. It is essential, too, that steps should be wider than the walk or opening from which they lead, to prevent their having a cramped appearance, and to give them an artistic effect. The tread should have a slight projection, as a plain moulding effect, and should slope sufficiently to allow water to run off.

To prepare for steps on terraced grounds, excavate on the slope, allowing for four inches of sub-foundation and four inches of concrete. Put in the sub-foundation of cinders or broken stone or bricks, providing a drain at the lower end to carry off any water that may accumulate. Concrete work often is ruined by water freezing under it and expanding. Place a plank along each side of the proposed steps, providing one wide enough to take in the riser of each step. The planks should be well braced their entire length to prevent any bulging. Lay a strip of woven wire fabric, or other reinforcing mesh, of a width nearly corresponding to the width of the steps and the full length of the steps on the slope. The next operation is to spread on the wire a layer of concrete about three inches apart, consisting of one part Portland cement, three parts clean, coarse sand and six parts broken stone or gravel. Sufficient water should be used to make a mixture that will work through the wire cloth and completely surround it. Tamp well and permit the concrete to stand for 24 hours.



Section.

Starting at the top, place the boards between the planks to form the risers of the steps. The inner top edge of each board should be grooved in a circular form to form the bottom of the nosing of the tread. Each board should be fastened securely to the planks. Just before the next mixture of concrete is applied the base of the concrete laid before should be wetted. The forms should be filled with a mixture of cement mortar, consisting of one part cement and two parts clear, sharp sand. Trowel the top and round at the edge to conform with the groove in the riser board.



Elevation.

No cement man should be satisfied to turn out a weak or No. 2 grade of cement. See if you cannot make the best quality. It pays far oetter.

Canadian and Belgian Street Architecture

A Comparison of the Various Types by Robert C. Kennard, Architect, of Toronto

In writing an article under the above heading the subject is of almost too great a scope to discuss in the limited space available. Upon examining the differences between the two countries, the one a country of comparatively recent growth, unhampered by traditions and prejudices, the other a country of venerable history and traditions, and what is of still more considerable importance, a climate vastly different from our own—everyone is prepared to admit that these must inevitably influence the designing and planning of buildings. In a land of little snow and frost, designs and construction can be attempted with success which in our own country would be practically an impossibility.

In making this comparison it will be necessary to take two cities which, although differing in architecture, are alike in their efforts to promote industry and commerce. It would be as ridiculous to compare two such different cities as Quebec and Brussels as it would be to compare Toronto or Winnipeg with Bruges and Hamburg. At the present time Belgium is in the midst of a great renaissance. Cities which have lain dormant for centuries are once more hives of industry, so that many towns of to-day are almost unrecognizable as the places of a few years back. In comparing these countries, therefore, we will take two progressive cities, whirh invite a fair comparison and criticism. Two such cities to my mind are Antwerp and Toronto. Both towns are of much the same size and both have a large shipping trade.

One of the foremost things that impresses a Canadian upon arrival at Antwerp is the regularity and orderliness of its architecture. Here, one is accustomed to see a large eight or nine-storey commercial house abutting a dwelling little more than a shack. Such a thing would never be tolerated in a Belgian city. Huge sky-scrapers are unknown. All the buildings are of three or four storeys, so that regularity and symmetry are obtained. In fact symmetry seems the keynote of the general architecture in Belgium. To the casual observer the buildings "en masse' seem very much alike, with their big projecting cornices and plastered surfaces, but upon examination the details are found to vary ronsiderably, so that time and consideration seem to be expended upon every building that is erected. It would be absurd to say that every building is of good design. A great many, in fact the majority, are open to severe criticism, but the general effect as a rule is invariably good. That the Belgian's mind in regard to his house differs considerably from a Canadian's must always be taken into consideration.

A Belgian makes his house to look at, and generally, as a last resource, to live in. We, on the other hand, consider well our interiors, believing that a house is to live in and not to look at. It is natural that the planning affects the design. A verandah in Belgium is a rarity. The balcony is used instead. Lawns and approaches to the houses, with the exception of a few cases, are unknown, and, apparently, undesired luxuries. Each storey has its balcony in which the occupants of the house sit in the long summer evenings. Many of these are ornamented with shrubs and plants which, when in bloom, give a picturesque appearance to the street. The absence of foliage is one of the first things a Canadian misses.

The planning of the Belgian house differs considerably from our own. Generally speaking, one enters through huge doors into a kind of small courtyard from which the stairs ascend and descend. This courtyard is generally paved with tiles of a more or less ornate pattern and is frequently ornamented with plants, statues, etc. Usually the interiors are sparsely furnished and by no means convey to the visitor that idea of comfort and home, to which we are accustomed over here.

With regard to the designing of public buildings, it is generally acknowledged that the French and Belgian people hold the palm. Individual tastes differ, naturally, and I certainly think some are considerably over-rated in regard to artistic beauty. A building in this respect is the Gare Centrale or Central Station of Antwerp, a huge erection covered with profuse and useless ornament, lavished on regardless of taste or meaning.

Another peculiarity which strikes one upon arriving at the Belgian port is the almost complete absence of wires. In this country one is accustomed to see wires suspended and running in all directions above our heads, the wires generally being supported on huge ugly poles placed at regular intervals. Electric signs everywhere (at least in the main streets) greet the eye, in the majority of cases conveying to the spectator every virtue and advantage under the sun save that of good taste. In Antwerp the wires are generally underground, but where the overhead system is necessary the standards are generally of real artistic merit, the upper portion frequently being of wrought iron and showing excellent taste in design and craftsmanship. Electric signs and advertisements are by no means so frequently met with as in Canada, and the fact of their being in Belgium does not give them a more artistic appearance.

Another thing that impresses one is the frequent excellence of the posters placarded in the city. Some are evidently designed by men of rare artistic ability. Taste and discrimination are shown in placing these posters throughout the streets. Prizes are awarded at certain times for the posters showing the most merit. Surely the Council of our own city might do something in this direction. Toronto is a beautiful city, as most people will readily admit, but how frequently are our eyes offended by some eyesore passing under the apology of an artistic poster placarded in some conspicuous spot.

The waterfront of Toronto is generally acknowledged to be one of the eyesores of the city. In most places this is generally the case. The waterfront of Antwerp presents between three or four miles to anyone travelling up the Schelt, yet it is by no means unsightly. One of the most beautiful sights is the approach to Antwerp on a misty morning, and the gradual appearance of the stately spire of the far-famed cathedral looming up out of the mist like some tremendous giant. Many important buildings have been erected on the waterfront and Antwerp does not present that meagre appearance that our own city assumes. Many of these are cafes, and, in the evening, the front is generally the scene of music and gaiety, presenting an animated appearance to visitors.

In this short article, as I mentioned before, the subject is of too wide a scope to be properly treated. It cannot be gainsaid that Toronto contains many buildings of architectural merit. Trees, grass and flowers beautify a city, and Toronto owes much of its beauty and popularity to them. At the same time one cannot overlook the monotony of many of the dwellings erected in the residential streets—house after house of apparently the same design and plan. A house should be designed according to the requirements of the inhabitants. It is the duty of every citizen, as well as a benefit to himself, to erect dwellings that show signs of some care and thought, instead of building and living in houses that seem to have been produced by some mechanical process.

On every side evidence is to be found of the growing interest the public are manifesting in architecture. An occasion now presents itself to the architects of Toronto to stimulate this interest, by training and enlightening the public that they may so discriminate between the good and the bad, that, in the near future, buildings will be erected which will be a credit both to the city and to the country.

Contracts and Specifications

At a recent meeting of the Engineers' Club of Toronto, Mr. J. E. Parsons, B.A., gave an interesting talk upon the subject of "Contracts and Specifications." Mr. Parsons said in part:

A kind of offer of very frequent interest to the engineer or contractor is that which purports to be open up to a certain date. Everyone is familiar with the ordinary advertisement for tenders, and it might be supposed that the municipality or person calling for tenders was bound to hold his offer open up to the time indicated, but in the light of recent cases the matter appears to be otherwise. As soon as the advertiser has received a tender which he regards as satisfactory, he is free to accept that tender and call the matter closed.

If a man undertakes to do that which is physically impossible, he will not be bound. A contract to make water run up hill is void, for it is contrary to the course of nature, and neither party is deceived, for both must be fully aware of the impossibility; but a matter is not to be deemed impossible simply because it has never yet been done. A man may have such faith in some new discovery or in some scientific principle that he undertakes to warrant the possibility of such a thing, although others do not believe as he does.

An interesting case is recorded at the city of London. When it became necessary to pull down the old Blackfriars bridge and replace it by another, the city engaged an engineer. He made surveys of the locality, and plans of the old bridge which had to be removed, also plans and specifications for the new bridge. The engineer in his discretion abandoned the use of cofferdams, and his plans were based upon the use of caissons. The contract stated that the information embodied in the plans was believed to be correct, but the contractor must satisfy himself as to the nature of the ground and must estimate the quantity of materials to be removed. The successful tenderer relied upon the plans and constructed the caissons according to the drawings, but in carrying out the work, they were too weak to stand the current from up stream, with the result that, being able to work only at low tide, he was put to a great deal of additional expense and loss of time. The contractor brought action for the amount of his loss, contending that the city of London was liable for the insufficiency of the plans and drawings prepared by their engineer. The Privy Council decided that the city did not warrant the feasibility of the works thus outlined and that when he chose to rely upon these drawings, he did so at his own risk as to whether the work could be successfully carried out as indicated in them.

The written agreement is not the contract. It is merely a statement by the parties of the facts which have been agreed upon and the contract is, of course, still in existence though this written evidence be burned or otherwise lost. However, it must be borne in mind that the writing is a much more formal and deliberate setting out of what the parties have agreed upon and that the negotiations, being prior to the writing, are either merged in the written agreement or dropped. It may be that many terms were discussed or particulars agreed upon before executing the writing, but which the parties had neglected to have inserted in this writing. In this case these provisos, made during negotiations, are entirely lost. The courts take the stand that when parties come to the formality of placing their agreement upon paper it must be supposed that they place the matter there in its final state and will not allow you to show that there were other terms agreed upon beforehand, but not put into the writing.

Where specifications and plans are referred to in the writing, these are read into the contract and become a part of the contract. Where there are discrepancies between a detailed drawing and one which is smaller or less minute, the detailed drawing is the greater authority. If there is a difference between the plans and specifications, the specifications prevail, and if between specifications and the written body of the contract, the latter prevails, for it takes precedence over all the rest.

In a reported case the specifications for a house covered in detail the roof, the joists, the walls, and, in short, everything but the flooring, while the contract was for "a house to be completed by Aug. 1st." The contractor did everything about the house except put in the flooring, and this he refused to do without extra remuneration. The courts reviewed the facts, that this item was clearly omitted from the specifications, but was none the less clearly called for by the contract for a finished house, and decided against the contractor.

The following officers were elected at the recent meeting of the Toronto branch of the Canadian Society of Civil Engineers: President, J. G. G. Kerry; Secretary-Treasurer, E. A. James; Committee, M. J. Haney, P. Gillespie, A. F. Macallum; Auditors, S. Gagne and A. C. Blanchard. A number of reports were presented by the various officers showing that the branch was in a flourishing condition. Mr. C. H. Mitchell, the retiring president, gave a brief review of the year's work, which showed that it had been a most successful one. The indications for the coming year are that it will be equally successful and that a number of important matters will be taken up. With its able president and officers, it is certain that the affairs of the branch for the present year will be looked after in a capable manner.

Messrs. C. Edward White and P. A. L. Foulds have formed a partnership as architects, under the firm name of White & Foulds, with offices at Sherbrooke, Que. They will be pleased to receive catalogues and samples from manufacturers.

Cement manufacturers should not let their customers think that coal-dust or clay makes good ballast. If they use it, look out for trouble

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Proper Methods of Furnace Installation

The first question we wish to take up in this article is in regard to laying out the framing of a house for the convenience of cutting the openings for furnace pipes. Many houses are heated with the warm air furnace, which makes it necessary for openings to be cut through floors and partitions to accommodate the pipes. Now, when a contractor has a house to build that is to be heated with a furnace, the first thing he should do is to properly locate all the registers on the plans. Some architects leave the location of the registers to the furnace contractor, but a competent architect can locate the pipes and outlets for furnace heating to just as good advantage as the furnace contrartor, and in making plans the architect should locate the place for registers and everything pertaining to the heating of the house.

When the contractor lays out the joists and portitions he should see that the joists on the floor above are directly over the lower ones, and that the studding are directly under the joists and in line with them (see fig. 1). When this is done there is no trouble in cutting the openings for the pipes and registers. On the other hand, if this is not done, and the studding and joists are put in without any regard to furnace pipes, then the contractor will find his troubles begin to multiply as soon as he begins to cut for the furnace pipes. He will find studding that must be moved; he will find joists that must be moved or cut into and headers put in; all this will consume three or four times as much time as will be required to cut the openings where a little care is exercised in spacing and setting the joists and partitions. The time taken to set the partitions to accommodate the pipes is practically nothing. We have heard contractor state that he would take a contract for a house heated with hot water or steam for fifty dollars less than he would if heated with a warm air furnace, because of the immense amount of cutting the furnace work requires. We consider the above statement not well founded; a contractor with such an opinion surely does not properly lay out the framing of the house, if such has been his experience. Let us lay out the house and we will agree to do all the cutting for the furnace pipes for five dollars. No man should be over one day cutting for furnace pipes in the average residence, and in some cases half this time would be plenty. The way to cut for furnace pipes is to have every pipe located and have one man, skilled in this kind of work, do the cutting; then when he starts to cut let him keep at it till the job is completed.

It is a great loss of time for a contractor to take men haphazard to do this work, calling a man away from his usual work at various times to cut for the furnace man as he happens to want it. All the cutting should be done at one time, in advance of the furnace man, by someone who understands it. Working here and there and cutting for furnace pipes by piece-meal does not pay.

If a contractor has the cutting to do for steam or hot water heating, he finds that there is no great amount of difference between cutting for steam or hot water heating and in cutting for the furnace, if some care is taken in setting joists and partitions.

Fig. 2 shows how studding and joists should be laid out on sills and girders where they lap by one another to keep them in line across the building. The studding on one sill are set the thickness of the studding to one side of the studding on the opposite sill. Then when the joists are placed they can be lapped on the girder in the centre, and each tier of joists will line up square across the building. How often we see joists put in lapped on a girder or partition, and scarcely a joist in the entire floor is square with the building. This frequently makes it bad in setting partitions that run parallel with the joists and sometimes makes extra cutting necessary.

It pays to be a little particular and exact in laying out work, the little extra time it takes is a mere nothing, while its advantages are very great and are apparent everywhere about a building laid out by a competent man who looks ahead a little in his work. The old saying, "Never cross a bridge till you come to it," may be handy for people to say at times, but be sure the bridge is there when you want it; it saves trouble.

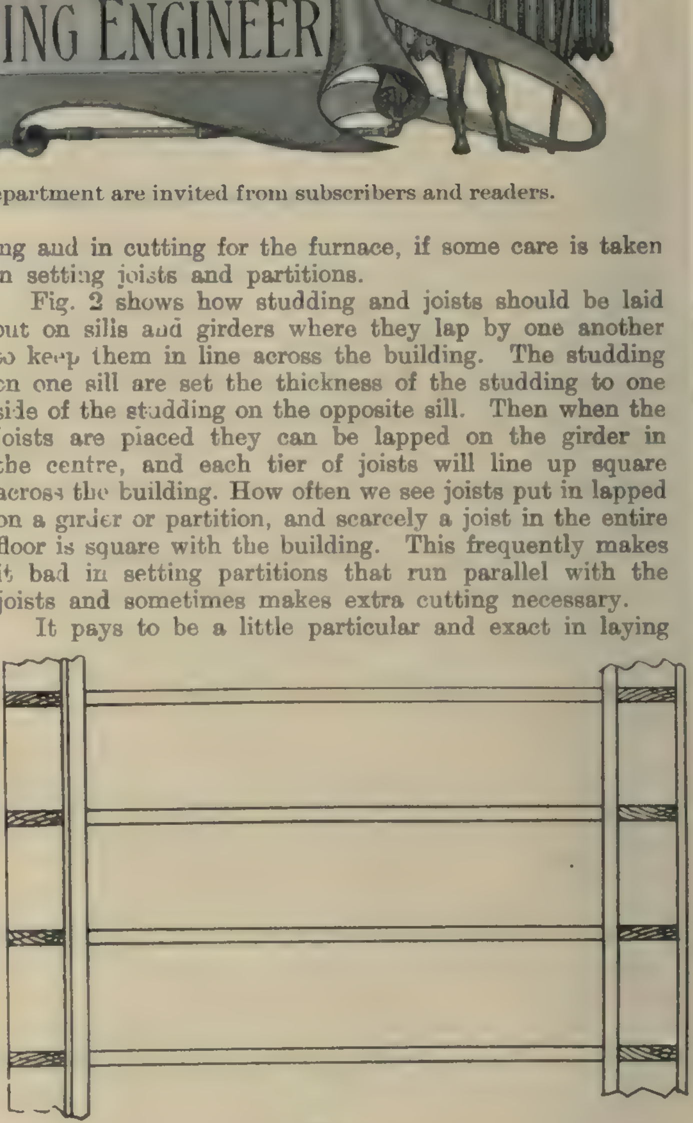


Fig. 1.

We wish next to impress upon the minds of builders and architects the importance of good chimneys and some means of proper ventilation.

As the prices of brick and bricklayers' wages are now unusually high, it makes the average house chimney run up to a high figure; consequently many people try to economize in chimney construction, much to the detriment of the heating and ventilation system of the building. There are many six and seven-room houses being built with only one 8 by 12 single flue chimney, which is expected to take care of the heating plant, the kitchen range and a laundry stove in the cellar, making three separate pipes to enter a single 8 by 12 flue chimney. A chimney of this kind may work, and then again it may be very unsatisfactory. If it does fail there is no remedy except to build another chimney in some other corner of the house; and sometimes there is no available space. It is surely false economy to build this kind of a chimney—the chances are that there will not be sufficient draft to operate the laundry stove, the kitchen range and the heating plant; and the efficiency of one, or perhaps all, will be greatly impaired. Fig. 3 shows the comparative size of the ordinary 8 by 12 flue chimney; the average cost of construction is $1 per lineal foot. With a chimney of this kind there is no system of ventilation, a thing that is being greatly overlooked even in the better class of buildings.

Fig. 4 shows a 12 by 12 flue chimney, which is none too large for operating a laundry stove, kitchen range and the heating plant. This is a flue that will furnish the necessary draft and can be depended upon to do the work required of it. Its cost is $1.20 to $1.25 per lineal foot. This chimney, like the one previously described, does not carry with it any means of ventilation.

Fig. 5 shows a chimney with a 12 by 12 flue to take care of the smoke from the heating plant, laundry stove and kitchen range, and an 8 by 12 flue for ventilation purposes. There is no doubt at all that every house should have at least one ventilating flue and it should be 12 by 12; still an 8 by 12 is better than none at all. When buildings are heated with a furnace, there should be a ventilating flue, to which a proper size ventilating pipe from each room should connect. The air comes into a room heated from a furnace and must displace the same volume of cold air that is in the room. This cold air must have some way to get out to make room for the incoming warm air. For the sake of saving a few dollars, no provision is now being made to properly take care of the cold, foul air, or to provide a way for its escape from the room; it is left for the warm air to force it out through little cracks under and around doors and windows. This is wrong; a way should be provided for the cold air to escape, and it should go into the ventilating flue, part of it at least. This purifies the air and the air that comes from the furnace is freshly heated pure air. Some take the dead air from the rooms and return it to the furnace to be continually heated over and over again and sent back to the rooms, claiming that it takes less fuel to heat the air because it is not so cold as the air from the outside air duct would be. This looks plausible on the face of it, but we have had experience with outside air ducts and with inside air ducts, and we will take the outside air duct; for, as a rule, the inside air duct does not furnish sufficient air, and if the furnace does not get the air, it surely can not heat it, nor deliver it to the rooms when wanted. Ample air supply should always be provided; if too much, part of it can be shut off, but if the supply is insufficient it is difficult to remedy the defect. No matter how cold the air is, the furnace will heat better with plenty of air supply than it will with an insufficient amount of half heated air; and the cost in the heating will be no greater.

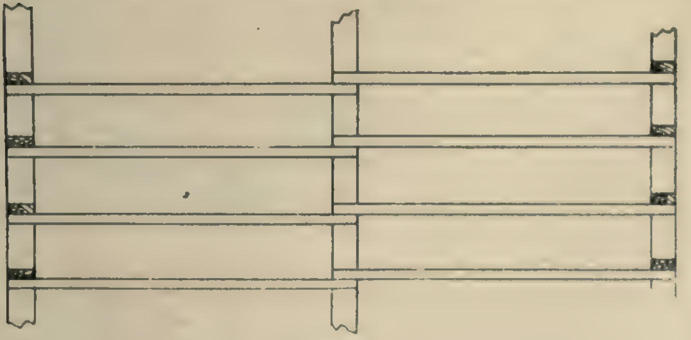


Fig. 2.

How about steam and hot water heat? As installed in the ordinary residence at the present time, there is no system whatever of ventilation--they simply heat continuously the same air that is in the room from morning till night and from day to day, except what little fresh air gets in through windows and door cracks. This is a fact and it is only in school houses or some government buildings that any system of ventilation is provided for with steam or hot water heat. In these buildings ventilation is provided for because it has to be; but in the residence the radiators are placed near or under a window—and they call it a system of ventilation.

In a flue there is a continual, natural upward draft; and this flue, if properly connected with ventilation pipes from the different rooms, will remove the foul air from the rooms connected with it in proportion to the size of the flue and of the rooms with which it connects. No matter what system of heating is installed, some ventilation should be provided for; this matter should not be left to take care of itself.

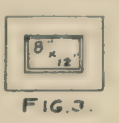


FIG.3.

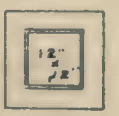


FIG.4

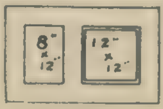


FIG 5

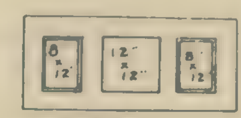


FIG.6.

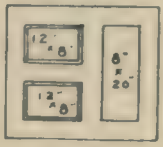


FIG. 7.

In the time of our forefathers, when mammoth fireplaces were in every house, and when houses were not nearly as tightly built as now, people lived longer and with less sickness than at the present. There were not as many weak and frail and puny people as now. Why? Those old fireplaces afforded ventilation and it took bone and muscle to keep them supplied with fuel. This manual exercise developed strength and health Air tight boxes to live in, with no ventilation, and idleness develops a race of puny, sickly people.

Fig. 6 shows another form of chimney which has two 8 by 12 flues and a 12 by 12 ventilation flue. In this, one 8 by 12 flue is designed for the laundry stove and the kitchen range, the other 8 by 12 flue exclusively for the heater, and the 12 by 12 flue for the ventilator.

Fig. 7 is another form with ventilating flue 8 by 20. Chimneys do not necessarily need to be after these particular patterns, but to be right should have an adequate flue for ventilation purposes, a flue exclusively for the heater and one for the stoves. Too much economy in building flues is detrimental to the heating and ventilating proposition.—I. P. Hicks, in the "American Carpenter and Builder."

The Ideal Manufacturing Company, Detroit, Mich., and Windsor, Ont., of "Quality Goods" fame, the makers of the well known "Ideal" plumbing lines, have just issued an attractive compendium catalogue of their principal products in the way of plumbers' supplies and gas appliances. Any one interested in these goods should write to the company, asking for pocket edition catalogue K. Quality and a close figure are guaranteed.

Mr. W. A. Elliott, architect, Brandon, Man., has opened a branch office at Saskatoon, Sask., with Mr. D. Gorman in charge. Mr. Elliott now has offices in Brandon, Moose Jaw and Saskatoon.

A Peculiar Septic Tank Sewage System

Interesting Letter from T. Aird Murray, of Toronto, Criticizing an Alleged Recent Discovery.

Apropos of the description of a septic tank sewage system which appeared in the "Contract Record" in the issue of Feb. 17th, we have received the following letter from Mr. T. Aird Murray, sanitary consulting engineer, 612 Continental Life Building, Toronto.

To the Editor of the "Contract Record":

The description of a "Septic Tank Sewage System" in your issue of Feb. 17th requires a little looking into. It is said to be the result of an accidental discovery at Watertown, Ill. One expects to hear something like this follow: "The secret was handed over to me by an aged Indian on his death-bed."

We have had placed very clearly before us of late certain data of a scientific and practical character with reference to septic action in tanks, both by the "Royal Commission on Sewage Disposal" and the very exacting "Hamburg experiments" just published.

It will be interesting to note how far this mysterious accidental tank in its action agrees with the above deductions. The following notes of description are taken from the article:

A.—Two tanks placed side by side; capacity, 70,000 gallons each.

B.—Water tight walls rendered with cement. Roof air tight, rendered with pitch. All crevices tightly sealed.

C.—Inlet and outlet flows below level of surface of sewage, thus forming traps, excluding air from tanks.

D.—A cross wall forming a weir, for purpose of retarding outflow from main tank.

E.—A filter box of sand and gravel provided at outlet of tanks, into which the sewage trickles, with no provision for equal distribution of liquid over the filler surface.

Here, then, we have described a simple air tight cesspool, and nothing more, with a crude rectangular filter box attached.

There are no notes as to the daily flow of sewage with which the above has to deal. We don't know the character of the sewage or anything about it. But we are told that sewage enters this tank, and we are told in wonderful allegorical language what happens to the sewage, both in the tanks and filter, as follows:

F.—The sewage entering the tanks remains until it fills to the level of the overflow. What happens after this we are not informed, but we may take it that, it overflows.

G.—In 24 hours (or a little over) after the sewage has entered the tank, a scum forms on the surface one inch in thickness, consisting of solid bacteria.

H.—The above (bacteria) prey on the poisonous matter and the solids contained in the sewage, fighting among themselves and destroying each other like Kilkenny cats, till nothing is left but the tail.

I.—The above tail represents two per cent. of poisonous matter, which escapes, but is at once eliminated upon exposure to the atmosphere.

J.—On chemical analysis the clear water from the tank represents only two per cent. of bacteria, that would in the slightest degree be injurious to the human system.

K.—The water, after it passes through the filter, has the remaining bacteria effectually destroyed .

L.—On opening the tanks not a handful of solid matter could be found.

M.—The secret of this accidental discovery is the dark air tight tank, the submerged inlet and outlets, and that bacteria will do their work if left alone. If stirred up they refuse to perform

I hardly like to insult your readers by taking the above statements in a serious manner. But, after due consideration I have come to the conclusion that they have been put forward as serious statements of fact.

We will just look into the statements as briefly as possible.

A.—Capacity. Contains no relative information and may as well have been omitted from description.

B. and C.—See Royal Commission Report, page 28, par. 48—"As regards digestion of sludge and quality of tank liquid, the closed tank possesses no advantages over the open tanks. See also "Hamburg Experiments," page 95.—"Perfect anærobic activity is also obtained in open septic tanks equally with closed ones." A sealed tank, as the one described, is an impossibility, it would burst to pieces by accumulation of gases, or be rendered inert.

D.—This weir is evidently provided to keep back floating matter, not to retard outflow from tanks.

E.—Filter box so constructed that the sewage would only trickle through at one point. Such a filter could have no effect on the sewage.

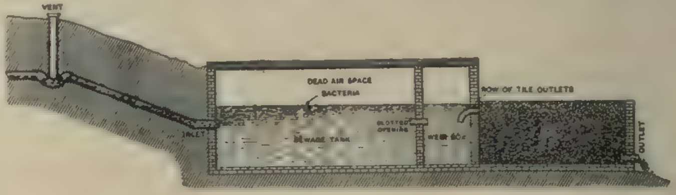


Illustration of System Criticized by Mr. T. Aird Murray.

F.—Contains an obvious statement, no one would doubt the fact that the sewage will remain in the tank till it fills. One does not expect it to go anywhere else in the meantime.

G.—See "Hamburg Experiments, page 85.—"It takes two minutes on the average for a scum ½-inch thick to form, from household sewage"—"with many sewages no scum is formed"—"The scum consists of plant remains, paper, hair, corks, and mostly fat, matted together by fungus growth, in which all kinds of worms and insect larvæ are found.

H.—The anærobic bacteria which are the accompaniment of putrefaction processes, are found not in the scum but principally in the precipitated solids and supernatant liquid in such tanks. The wonderful description of these bacteria preying upon the solids and fighting and eating up each other is a fanciful description, which requires modification by a little scientific study into the habits of micro-organisms, accompanied with a little chemical and biological knowledge of putrefaction processes.

I. and J.—See Royal Commission Report, page 229,
Concrete stairs and steps are of two classes, those
par. 340.—"The liquid issuing from septic tanks is bacteriologically almost as impure as the sewage entering the tanks." See also results of "Hamburg Experiments" on this head.

K.—No filter of gravel or other coarse material has

(Continued on Page 40)

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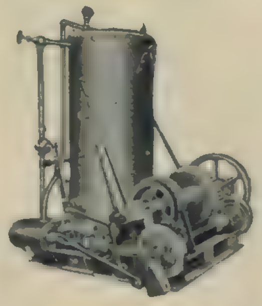

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any or very little effect in reducing numbers of bacteria. See all recent experiments in sewage disposal.

L.—See Royal Commission Report, page 229, par. 340.—"All the organic solids present in sewage are not digested by septic tanks." With a domestic sewage, and tanks worked at a 24-hour rate, the digestion is about 25 per cent.

M.—Contains a theory which has long been exploded. See above remarks and quotations. "If stirred up they refuse to perform." Evidently, to the describer of this mysterious tank, the bacteria are quite unlike the ordinary lions in a wild beast show, although his description generally of their actions is more in this line.

With reference to J, it may be explained that chemical analysis does not show the presence or otherwise of bacteria. Such is only proved by biological analysis.

In connection with the experiments which have been carried on at the Hamburg State Institute of Hygiene for the last ten years, and only recently published, we find on page 83 the following statement: "Reports by engineers and sanitarians have not been found wanting in which it has been stated that sewage could be converted in such an apparatus into a non-putrescible liquid. The mistake has only been recognized after trial, and much money has been uselessly spent on this kind of apparatus. All experiments and practice prove that sewage cannot be rendered non-putrescible by septic action."

Evidently the discoverer of this accidental but apparently wonderful tank must be ranged amongst the above misguided and deluded individuals.

T. Aird Murray.

Improved Concrete Machinery

The great increase in the use of cement within recent years has naturally caused activity in the production of concrete machinery. Many different mixers have been placed on the market, and concrete engineers and contractors are naturally interested in any machine that suggests an improvement on what they have been using. The Rogers Supply Company, of Toronto, have been appointed Canadian agents for the Hadsel mixer—a machine which has been attracting wide attention in the United States and Canada. It is known as the "Hadsel Non-Tilting Batch Mixer." This mixer was designed and is being built under the personal supervision of A. D. Hadsel, a well known concrete engineer and contractor. It is stated that Mr. Hadsel had no intention of placing a machine on the market, but merely kept on making improvements on machines he used from time to time and eventually produced one that he was induced to place on sale. The particular features which he has introduced in his mixer are as follows:

The Hadsel Mixer

The octagonal drum, instead of being constructed of steel plate, is made of cast iron, and to avoid the gear rings working loose, the teeth are cast on the plate, and when the entire eight segments are bolted together makes a complete gear ring which cannot get out of alignment. This cast iron construction, it is quite apparent, makes it more durable than the steel plate drum, and should an accident occur, whereby any of the cast iron segment are broken, they can be readily replaced, as all parts are interchangeable.

The octagonal feature of the drum, it has been demonstrated by experience, will thoroughly mix concrete in a few revolutions without the use of paddles or buckets, but the addition of pressed steel buckets and deflectors insures a mix that is thorough and rapid, as the material is not only carried from the bottom to the top of the drum and dropped, but is given a sidewise motion by the deflectors.

Another patented feature is a cast iron ferrule, very much resembling a "V" shaped groove, which is riveted around the discharge opening, on the inside of the head, and catches all the splash from the interior of the drum, preventing the mix from spilling out on the ground.

The convex-faced rollers are also a noteworthy improvement. These support the drum through the medium of U-shaped rings, which are riveted to the end plates of the drum, and prevent side play. Not only do these rollers fulfil this office, but they absolutely prevent the drum from "jumping the track," as no material can find lodgment on the convex surfaces of these rollers. On the ½-yard mixers, the rolls are 26 inches in diameter, and fully capable of sustaining their load.

The bed plate, on which the driving mechanism of the machine is located, is cast in one piece and accurately machined, thus assuring a perfect alignment, which could not be secured if these pieces were bolted separately to blocks or skids.

While it has been shown that in the half-yard mixers only 6 horse-power is required to drive the machine, an excess of power is supplied not only to insure perfect operation of the machine in the hands of an unskilled laborer, but also to take advantage of the winch-head, which is located on the driving shaft, and which may be used advantageously in a number of different ways which may suggest themselves to the contractor, such as hauling the machine up a steep embankment under its own power, and for hoisting materials of different kinds.

All size mixers are equipped with loading skip when required. They can be furnished with either steam, electric or gasoline drive, mounted on skids or trucks.

The Hadsel mixer will be on exhibition at the Cement Show in Toronto, March 1st to 6th. The Rogers Supply Company, 8 King street east, Toronto, have the exclusive selling agency for the Dominion and will be pleased to give particulars about the machine to any one interested. A very handsome catalogue has been prepared and copies will be sent on request.

The Raymond Concrete Pile Company, of Montreal, with offices in New York, Chicago and Pittsburg, are making a very interesting exhibition at the Cement and Concrete Show, now being held in Toronto, showing their system of making and placing concrete piles. A model pile driver has been erected and demonstrates their system of placing a steel shell in the soil by means of a collapsible steel core, withdrawing the core and thereupon filling the shell with concrete.

This system has been adopted on several viaduct structures by the Canadian Pacific Railroad, as well as by the Government for the harbor sheds at Montreal.

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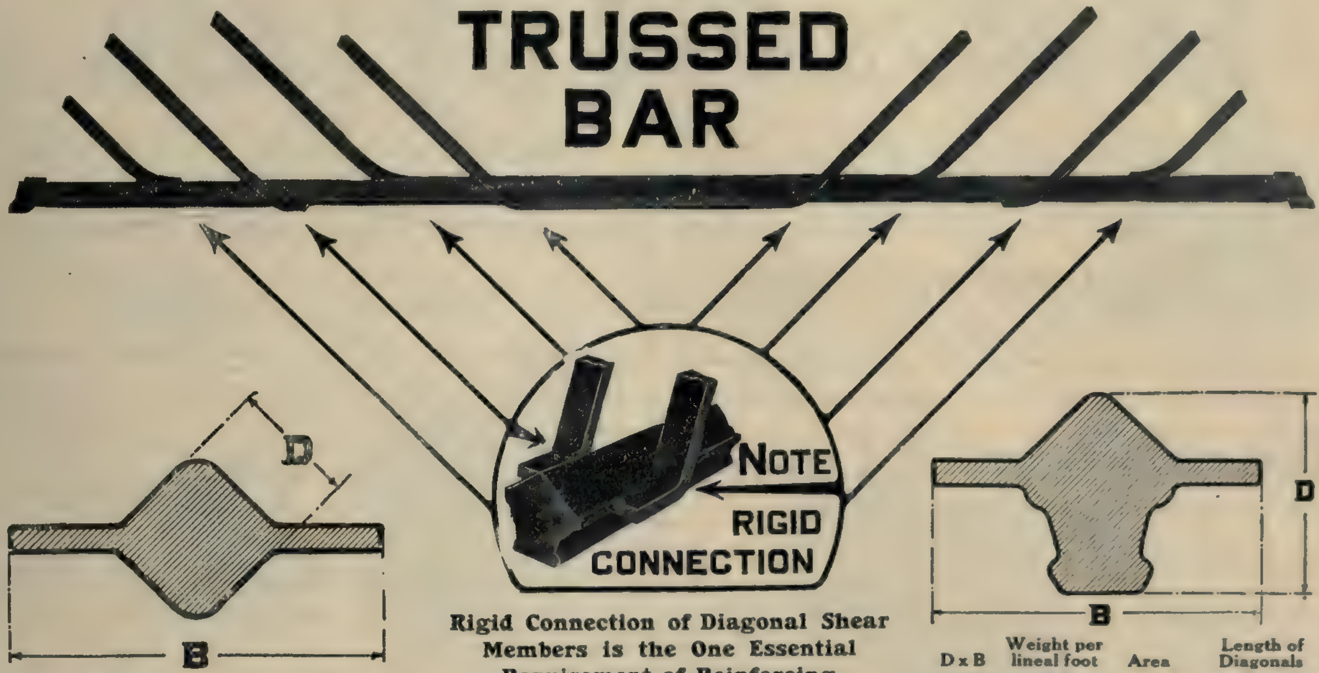

D x B	Weight per lineal foot	Area	Length of Diagonals
½x1½in.	1.4 lbs.	0.41 sq. in.	6in., 8in. 12in.
¾x2 3-16in.	2.7 lbs.	0.79 sq. in.	12in., 8in., 18in.

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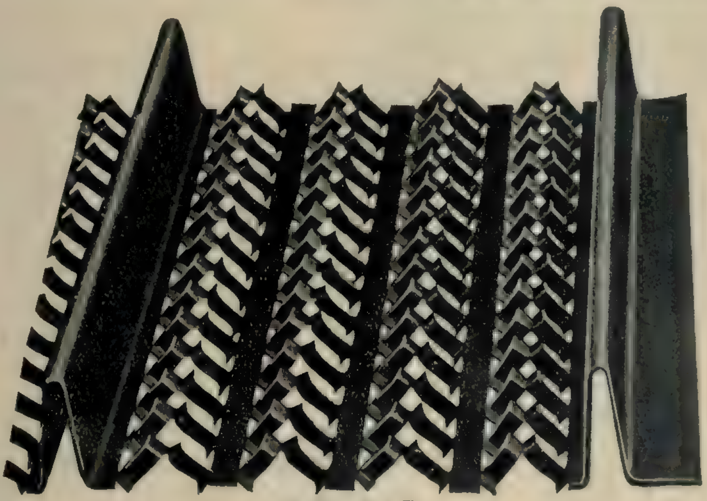
2 x3½in	10.2 lbs.	3.00 sq.in.	30.24.36.48 in.



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3	24 "	2.00	.36 "
4	32 "	2.67	.27 "
5	40 "	3.33	.216 "
6	48 "	4.00	.18 "
7	56 "	4.67	.154 "
8	64 "	5.33	.135 "

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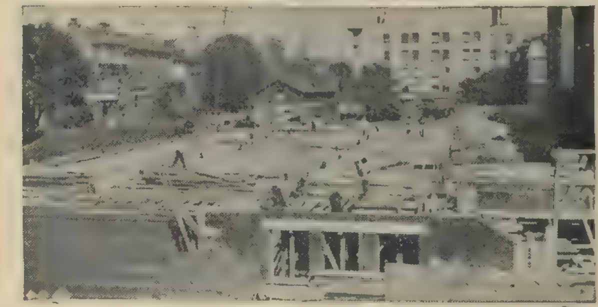

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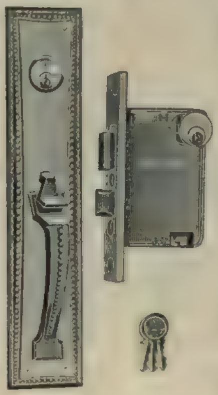

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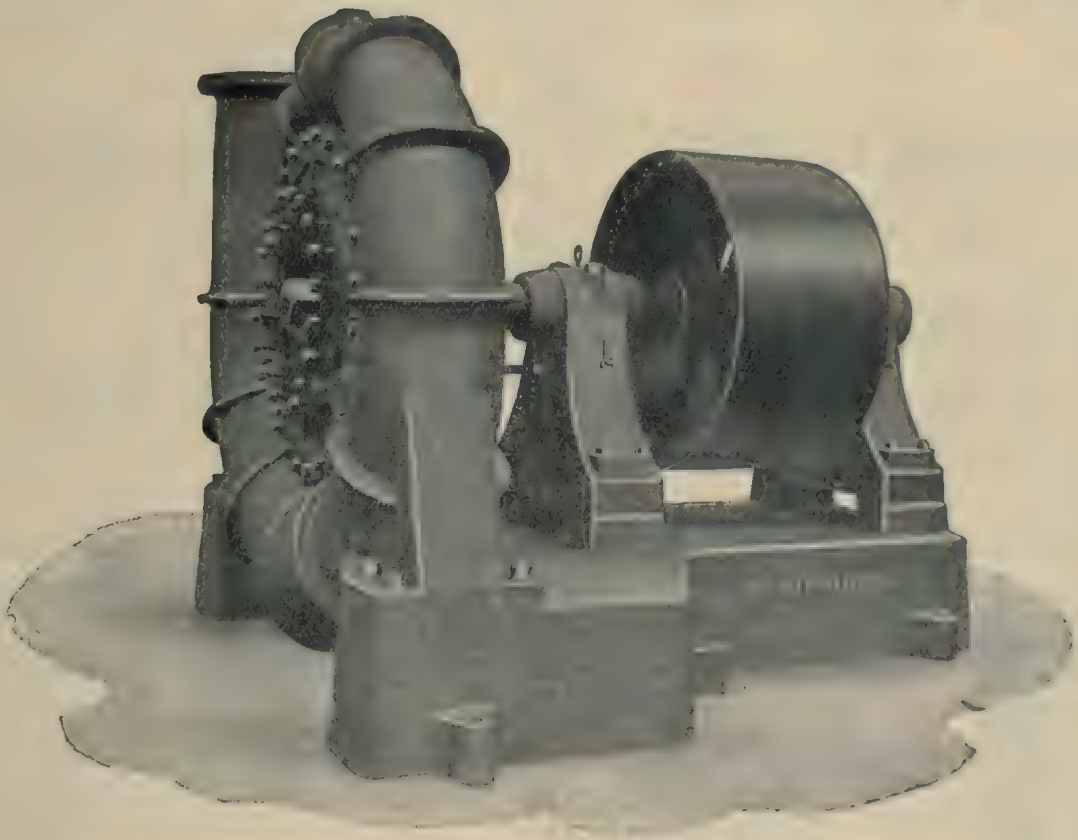

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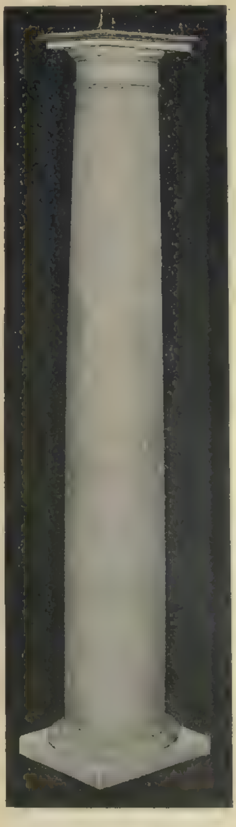

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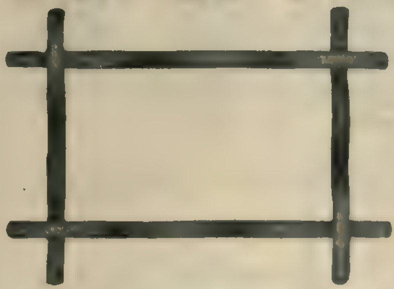

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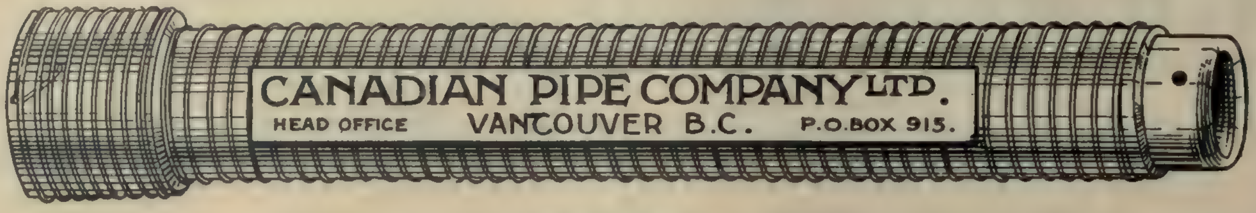
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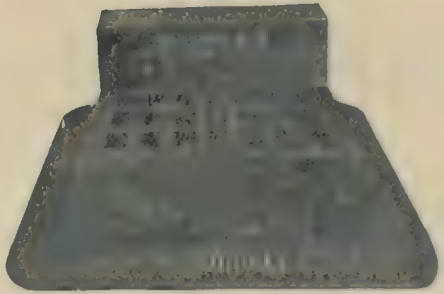

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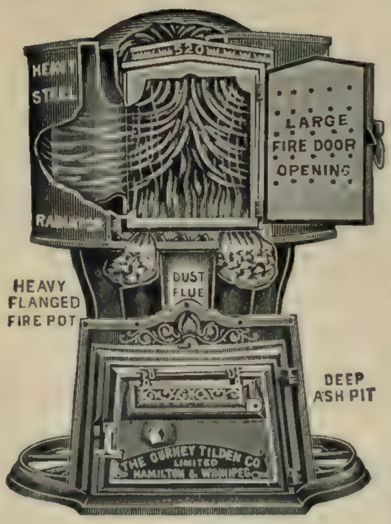

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Calgary, Alta.
Tenders are invited until March 22nd for supplying the city with sewer and water pipes. (See advertisement.)

Fort Frances, Ont.
The time for receiving tenders for water works and sewer construction has been extended until April 15th. (See advertisement).

W. H. Elliott, Town Clerk, is taking tenders up to Thursday, April 1st for labor and materials for waterworks and sewerage. The materials include cast iron pipes, special castings, gate valves, hydrants, vitrified tile pipe and manholes.

Hull, Que.
The Council is considering the extension of Chandiere street at an estimated cost of $7,000.

Upon the recommendation of City Engineer Farley, the City Council has decided to provide new hydraulic pumps for the water works at an estimated cost of $40,000.

Moncton, N.B.
The time for receiving tenders for supplying the City Council with an electric turbo pump has been extended until March 20th.

Moose Jaw, Sask.
J. D. Simpson, Secretary-Treasurer, gives notice of the city's intention to carry out the construction of various concrete and plank sidewalks as local improvements.

Ottawa, Ont.
The city will seek authority to raise $12,000 by debentures for the necessary improvements and alterations at the Isolation Hospital.

Toronto, Ont.
Tenders will be received until March 16 for the supply of cast iron water pipe for the year ending April 1st, 1910; also for the laying and jointing of pipes, valves, hydrants, special castings, etc., up to 31st of December, 1909. Address Jos. Oliver, Mayor, Chairman Board of Control, City Hall, Toronto.

Messrs. Rudolph Herring and J. D. Watson, the experts retained by the city to report upon the question of sewerage disposal, have adopted in their general outline the plans submitted by City Engineer Rust. There are certain modifications. One of these is that the sewer be extended at least 15,000 feet further into the lake, to insure a discharge into deeper water. City Engineer Rust states that the changes will not affect tenders already received. He hopes that now the report has been made the work of construction will be begun without delay.

Vancouver, B.C.
The Esquimalt Waterworks Company has made an offer to supply the city with water at four cents per 1,000 gallons if the city guarantees to take at least 3,000,000 gallons per day.

Winnipeg, Man.
The Board of Control have decided to take tenders for water works valves and hydrants to be used on the domestic water service.

C. J. Brown, City Clerk, gives notice of the city's intention to carry out as local improvements granolithic walks on Langside street, plank walk on Irysh avenue and sewer construction on Elgin avenue.

AWARDED.

North Toronto, Ont.
The contract for the construction of a 4-foot concrete sidewalk on Davisville avenue and Brownlow avenue has been awarded to the Artificial Stone Paving Company at 49 1-2 cents per lineal foot.

Victoria, B.C.
Tenders for the supply of lumber and paving blocks to the city were recently opened as follows: Cameron Lumber Company, lumber, from $11.50 to $25, according to sizes; paving blocks, $10.50, $11.50 and $13.50, according to sizes. Shawinigan Lake Lumber Company, lumber, $10 to $25; no tender for blocks. J. A. Sayward, lumber, $10 to $25; paving blocks, $8.75, $10 and $12.50. James Leigh & Sons, lumber, $14 to $29; paving blocks, $10, $11 and $13.75. Lemon, Gonnason Company, lumber, $12.85, to $25; paving blocks, no tender.

Winnipeg, Man.
At a recent meeting of the Board of Works the tender of W. F. Lee was accepted for an emergency supply of sewer pipe and junction. The order is for 3,600 feet of twelve inch pipe, 300 junction 6 by 12, and 22 junction 6 by 15. The price is $2,248.

Railroads, Bridges and Wharves

Brandon, Man.
It is announced that the C. P. R. will commence work immediately on the overhead bridge at First street.

Edmonton, Alta.
It is stated that the C. P. R. are going ahead with plans for the proposed high level bridge.

Blind River, Ont.
The Blind River Colonization Railway are applying for incorporation. It is proposed to run a line north from Blind River to the junction of the National Transcontinental. The town of Blind River has voted a bonus of $17,000.

Fredericton, N.B.
Tenders addressed to John Morrissy, Chief Commissioner, Department of Public Works, Fredericton, will be received until April 25th for the construction of four metal superstructure spans for the Fredericton highway bridge, each span consisting of a through pin connected structure of 260 feet from centre to centre of end pins. Plans and specifications may be seen at the Department.

Glen Oak, Ont.
Tenders addressed to Thos. Bairne, Glen Oak P. O., or to C. H. Lockwood, Township Clerk, Mt. Bridges, will be received until April 5th for the construction of a reinforced cement bridge on the 4th side road in concession 7, Caradoc. Plans and specifications may be seen at the office of "The Age," Strathroy.

Montreal, Que.
The Grand Trunk Railway Company have filed plans for the proposed freight yards at St. Lambert, which will comprise 100 acres. It has not yet been announced when work will be commenced.

The Railway Commission have ordered the C. N. R. to reorganize their Montfort branch between St. Jerome and Arundel. Among other improvements the line will be ballasted and the light rails replaced by heavier ones.

Ottawa, Ont.
The Crawford Bay and St. Mary's Railway is applying to the Dominion Government for authority to change their name to the British Columbia, Alberta, Saskatchewan and Manitoba Railway, and to extend the time for the construction. The project is a most important one. The proposed railway will run from Hartney, Man., through to Pilot Bay, on the Pacific coast, connecting the Manitoba wheat fields and the western outlet.

Owen Sound, Ont.
A large deputation from Owen Sound, Meaford and the surrounding districts, waited upon the Provincial Government last week to ask for assistance in the construction of the proposed 28-mile railway between Owen Sound and Meaford. The government promised to carefully consider the matter, but made no definite statment.

Southampton, Ont.
The Indian Department are asked to authorize a contribution from the Indians of $3,000 towards the construction of the proposed bridge at this place.

St. John, N.B.
Plans for the proposed Navy Island bridge, as submitted by F. W. Holt, C.E., call for an estimated expenditure of $750.000. The main structure will be 1,500 feet long.

At a recent meeting of the Board of Works, it was decided to recommend to the City Council the rebuilding of the Wiggins' wharf, West Side, and the construction of a 300 foot ell at the end. Estimated cost $3,500.

Vancouver, B.C.
The C. P. R. will probably extend their tracks from the Pacific coast mills to Coal harbor bridge.

The Great Northern Railway is calling for tenders for the construction of a branch line across the east end of the city from its present tracks to the deep water front of the inlet.

The final location of the G. T. P. from Edmonton to Prince Rupert is completed, and engineers will shortly survey the Vancouver branch from a thirty-mile radius of Fort George and Vancouver.

A delegation consisting of Mayor Douglas, ex-Mayor Bascombe, W. R. McKinnis and others, recently waited upon the Dominion Government in regard to the proposed harbor improvements at the coast.

G. A. McNicholl, purchasing agent for the G. T. P. is calling for tenders for the supply of 300,000 cross and switch ties and 4,000 telegraph poles for use on the first 100-mile section between the terminus and Kitsalas canyon on the Skeena river.

Victoria, B.C.
$2,040 will be expended upon repairs to the wharf at the city's electric lighting plant.

AWARDED.

Montreal, Que.
The G. T. P. has awarded a contract for 25,000 tons of steel rails to the Soo Company for delivery at Fort William. They also require 15,000 tons at Prince Rupert, the order of which will probably go to the Dominion Iron & Steel Company, Sydney.

Public Buildings, Churches, Schools, etc.

Blenheim, Ont.
At the fifth annual meeting of the Western Ontario Brickmakers' Association, held here recently, a resolution was passed asking the Provincial Government to set aside $10,000 for the establishment of a technical school for clay work.

Brantford, Ont.
The Collegiate Board have had plans prepared for a new building to cost $73,895, with $5,145 for equipment, and will ask the City Council to provide the amount required without submitting a bylaw to the ratepayers, who defeated a measure for the purpose in January.

Chatham, Ont.
The Board of Education have received from the Inspector of High Schools a notification that a new wing is required at the Collegiate Institute, also a gymnasium. These improvements would incur an expenditure of about $30,000.

Collingwood, Ont.
The Board of Education are contemplating the erection of a new school building in the west end of the town.

Estevan, Sask.
A. E. McKay, Secretary-Treasurer, Estevan school district, invites competitive plans until March 22nd for the erection of an eight-roomed school building of brick construction.

Glencoe, Ont.
Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until March 22nd for heating apparatus for the public building at this place.

Kingston, Ont.
A deputation from this city will interview Premier Whitney on March 10th to ask for a grant of $150,000 for the erection of a new Chemistry building in connection with the School of Mining.

Kilgorie, Ont.
Tenders will be received by W. J. Dorsey, Secretary of the School Board, until March 20th, for the erection of a public school building in school section No. 15, Mulmer. Plans and specifications may be obtained from the Secretary of the Board.

Lindsay, Ont.
The County Council has approved of the plans of G. M. Miller, architect, 59 Yonge street, Toronto, for the proposed enlargement and improvement of the Registry Office. The improvements will cost approximately $7,000.

Minnedosa, Man.
Tenders addressed to the Chairman of the Minnedosa School Board will be received at the office of the Secretary-Treasurer at Minnedosa, or of the architect at Winnipeg, until March 15th for the erection of a six-roomed school building at this place. Plans and specifications may be seen at the office of E. Bailey Fisher, Secretary-Treasurer, Minnedosa, or at the office of W. W. Blair, architect, Winnipeg.

Moncton, N.B.
Tenders will be taken at once for improvements to the city building.

Mount Green, Sask.
Tenders addressed to G. A. McNamar, Secretary-Treasurer, Lucky School District, will be received until March 22nd for the erection of a frame school house. Plans and specifications may be obtained at the "Mercury" office, Estevan.

New Westminster, B.C.
Tenders close March 12th with F. C. Gamble, Public Works Engineer, Victoria, B.C., for the new Land Registry Office to be erected here.

Oak Bay, B.C.
A new jail will be built here at an early date.

Ottawa, Ont.
The Elgin street school will be enlarged at a cost of $4,000.

Extensive alterations will be made to the First Baptist Church. Estimated cost $11,000.

Revised tenders will be taken for the erection of a grand stand at the Exhibition grounds. The estimated cost of the new building is $85,000. It will include fire and police stations.

Plans for a new synod hall for the Anglican churches of this city have been submitted to the authorities by Colborne P. Meredith, architect, this city. The new building will be three storeys high and of brick construction. Building operations will be commenced as soon as the site is secured.

Peterborough, Ont.
A meeting of the congregation of Knox church will shortly be held to decide upon plans for a new building.

Port Granby, Ont.
Tenders will be received until March 25th by Wm. Payne, Secretary-Treasurer, School Board, for the erection of a public school building in S. S. No. 1, Clarke township. Plans and specifications may be seen at the Secretary-Treasurer's office.

Qu'Appelle, Sask.
Tenders for the construction of a frame schoolhouse will be received until May 1st by John Seibel, Secretary-Treasurer, Tache school district.

Richibucto, N.B.
Tenders will be received by Dr. Thomas J. Bourque, chairman of school trustees, until March 20th for the erection of a public school building at this place. Plans and specifications may be seen at the office of Dr. Bourque.

Ridgetown, Ont.
Tenders have just been taken for all trades in the erection and remodelling of the Howard township hall. J. L. Wilson & Son, architects.

Sherbrooke, Que.
White & Foulds, architects, this city, have prepared sketches for the proposed extension to the Sherbrooke Protestant Hospital.

Strathcona, Alta.
The Market Committee of the City Council, composed of Aldermen Tipton, Elliott and Duncan, are taking up the question of the proposed new market building.

Stratford, Ont.
Ireland & Killer, architects, this city, are preparing plans for a new school building of brick and stone construction, for the Public School Board. Estimated cost, $15,000. Tenders will be called about April 1.

St. John West, N.B.
Tenders will be received until April 2nd by N. Tessier, Secretary, Department of Public Works, Ottawa, for a town clock for the post office building.

Sydney Mines, N.S.
At a recent meeting of ratepayers, it was decided to secure the sum of $20,000 for the purpose of erecting a fire proof school building at this place.

Toronto, Ont.
The Board of Education have appointed a committee to look over the Pape avenue school and report upon the alleged need of a new building.

Tenders will be received by J. T. Hynes, architect, 199 Yonge street, until March 19th for the plastering of St. Helen's R. C. Church, Dundas street and St. Clarens avenue.

Uxbridge, Ont.
The Public Works Department has purchased a site for the erection of a public building.

Victoria, B.C.
At a recent meeting, the School Board opened tenders for the new Chambers street school, and forwarded them to the building committee for consideration and report.

West Toronto, Ont.
At a meeting of the Collegiate Institute Board, Chairman Ellis reported that the cost of putting the Institute into repair and adding eight rooms, including gymnasium and lavatories, would be $45,000. The matter is in abeyance.

Woodstock, Ont.
It is stated that the Lutheran church are contemplating the erection of a new building.

Winnipeg, Man.
A new wing will be built to the court house on Kennedy street. Estimated cost $200,000.

A site for the Children's Home has been selected on the south bank of the Assiniboine river, adjoining the C. N. R. bridge and street railway track.

The Winnipeg Horse Show Association will erect a pavilion on the property between Osborne and Colony street at an estimated cost of $40,000.

The Granite Curling Club will erect a three-storey rink, of brick construction, on Hargrave street, at an estimated cost of

$40,000. Rugh & Riddell, architects. Tenders will be called at once.

In his annual report to the Parks Board, G. Champion, Superintendent of Public Parks, recommends a number of improvements, including potting and tool sheds, estimated to cost $1,150; green house with boiler and heating complete, $1,700; etc.

Welwyn, Sask.
The C. P. R. will erect a new station here this spring.

Yarmouth, N.S.
At a recent meeting of the Yarmouth Council it was decided to grant the sum of $4,600 for the purpose of rebuilding the Park avenue school, in school section No. 18.

AWARDED.

Kingston, Ont.
The City Property Committee have awarded to F. W. Spangenberg of this city, at $2,009, a contract for a clock and bell for the city buildings.

Montreal, Que.
The contract for the erection of the 65th Battalion's new armory, on Pine avenue, has been awarded to Labelle & Lessard, this city.

W. E. Doran, architect, this city, has awarded to C. E. Teakin, Montreal, the contract for the erection of the United States Immigration Offices.

Kingston, Ont.
Contracts have been awarded by Queens University for the erection of a two storey stone observatory.

Residences

Edmonton, Alta.
H. A. Magoon, architect, this city, has prepared plans for a double house of brick and wood construction to be erected on Sixth street for George Stevenson at a cost of $8,000.

Preston, Ont.
Tenders addressed to J. H. Mickler, architect, will be received until March 20th for the erection of a brick residence for the Rev. Father Gehl. Plans and specifications may be seen on application.

Stratford, Ont.
Ireland & Killer, architects, this city, are preparing plans for a residence for Dr. Silcox. Pressed brick construction; estimated cost, $4,500.

Toronto, Ont.
H. S. Mara, real estate agent, reports the sale of a building site on Palmerston Boulevard to Ausman & Marshall, for the erection of two residences.

Recent building permits include: Chas. Bonnick, 2 storey and attic brick dwelling, Admiral road, $7,000; G. Mai, five attached 2 storey and attic brick dwellings, University avenue, $9,000; J. G. Scott, 2 storey and attic brick dwelling, Dunvegan road, $8,000; R. C. Bustard, 2 1-2 storey brick dwelling, Rowanwood avenue, $5,000; J. W. Mitchell, 2 storey and attic brick dwelling, Dunvegan road, $5,800; Samuel Young, jr., two detached 2 storey brick dwellings, Rowanwood avenue, $7,600; R. A. Unsworth, 2 storey and attic brick dwelling, West avenue, $2,500; W. Gardiner, pair semi-detached 2 1-2 storey brick dwellings, Fern avenue, $5,000; Wm. Greaves, three attached 2 storey and attic brick dwellings, Clinton street, $6,000; T. H. Cooper, three detached 2 1-2 storey brick dwellings, Madison avenue, $20,000; Mrs. E. Garton, two detached 2 storey and attic brick dwellings, Sunnyside avenue, $6,000; W. Dinsmore, 2 storey and attic brick dwelling, Geoffrey street, $3,000; C. McCracken, 2 storey and attic brick dwelling, Havelock street, $3,500; Ernest Chapman, 2 1-2 storey brick dwelling, Sidney street, $4,400; R. W. Harrison, seven attached 2 storey brick dwellings, Dupont street, $8,000; C. Baker, 2 storey and attic brick dwelling, Palmerston Boulevard, $5,000; A. Henderson, 2 storey and attic brick dwelling, Constance street, $3,000; Wm. A. Forster, pair semi-detached 2 1-2 storey brick dwellings, George street, $5,500; R. C. Bustard, pair semi-detached 2 storey and attic brick dwellings, Pricefield road, $11,000; R. Burkell, one pair semi-detached 2 storey brick dwellings, Dovercourt road, $5,000; H. F. Squires, 2 storey and attic brick dwelling, Palmerston Boulevard, $3,800; David Stirton, two pairs semi-detached 2 storey and attic brick dwellings, Fern avenue, $10,000; Chas. E. White, 2 storey and attic brick dwellings, Constance avenue, $3,000.

West Toronto, Ont.
H. Gaffney will commence operations in the spring by erecting fifty semi-detached brick houses on the north side of the town. The houses will be erected on the west side of Weston road, just north of Davenport road. The total cost will exceed $40,000.

Winnipeg, Man.
D. W. Bellhouse, architect, has prepared plans for the erection of three new residences in Crescentwood, estimated to cost $6,000 each.

Wardell & Nichols, architects, are stated to have prepared plans for an addition to one of the large apartment blocks on Portage avenue, calling for thirty extra suites.

J. A. Gould, architect, is preparing plans for a modern apartment block to be erected on the northeast corner of Spence street and Ellice avenue this season for Mr. L. Lewis.

G. G. Teeter, architect, is preparing plans for several semi-detached houses on Beverley street for the McLaughlin Real Estate Company. Total estimated cost, $14,000 to $15,000. Mr. Teeter also has plans in hand for two new apartment houses.

Business Buildings and Industrial Plants

Belleville, Ont.
J. Bruce Smith, Inspector of Prisons, has ordered an addition to the court house here at a cost of $30,000.

Calgary, Alta.
The City Commissioners are considering the matter of assisting the Calgary Natural Gas Company to the extent of $10,000.

Chatham, Ont.
A large departmental store will shortly be erected by Mr. Gagnier on the property adjoining his hotel. It is understood that Mr. Gagnier has already purchased some of the material. Work will be commenced at once.

Cornwall, Ont.
The Sterling Bank of Canada has purchased a site on the corner of Pitt and Second streets on which they will either erect a new building or remodel the old block.

Daysland, Alta.
The building occupied by Creech & Adair was damaged by fire last week.

Edmonton, Alta.
Forty-three new elevators will be built in this province during the current year. The Alberta Pacific Elevator Company will build twenty-five, the Alberta Grain and Elevator Company, eight, and private firms ten. The majority will be in the southern part of the province, although a few are as far north as Strathcona.

Estevan, Sask.
Wortman & Ward, London, Ont., manufacturers of washing machines, pumps, etc., contemplate the erection of a factory here at a cost of $75,000.

Hamilton, Ont.
The Dewswell Manufacturing Company will erect a large addition to their works.

The Stanley Mills Company will shortly erect a number of new buildings on their property on John street.

Messrs. Stewart & Witton, architects, recently purchased the property of the old Central church, on which they will erect a four storey factory building, with basement, as soon as plans can be prepared.

Stewart & Witton, of this city, have purchased the old Central church property which was destroyed by fire. They will erect a four storey building, with basement, for light manufacturing purposes.

Chas. Mills, architect, has completed plans for a large store builidng to be erected on John street south. The building will be commenced in the spring, and will be occupied by the Mills Hardware Company.

Kamloops, B.C.
It is stated that the Bank of Hamilton will erect a $30,000 block at this place.

An addition will be built to the Arrowhead lumber mills at this place at a cost of $20,000.

A summer hotel to contain 36 rooms will be erected by Frank Rushton at Sportsman's resort on Jamieson creek, 17 miles up the North Thompson river.

Montreal, Que.
Jos. Sawyer, architect, 497 Guy street, has prepared plans for a 2 storey hall to be erected in St. Henry for Mr. A. Delorme, Laporte avenue.

Eric Ham, architect, 30 St. John street., has prepared plans for the erection of a 6 storey stone front to the premises of the John D. Ivey Company, Limited, 240 Notre Dame street west.

David Ogilvy will prepare plans and supervise the construction of the departmental store to be erected by Jas. A. Ogilvy & Sons, corner of St. Catherine street west and Mountain street. Estimated cost, $400,000.

Jas. E. Wilder has purchased two blocks of property corner of Bleury and Ontario streets. These will in all probability be used as the site for the new store for W. H. Scroggie, Limited.

New Westminster, B.C.
The plant of the Fraser River Tannery Company has been sold to the Swift Packing Company, of Chicago. The plant will be greatly enlarged in the near future.

At a recent meeting of the Board of Trade, a committee composed of J. Peek, T. J. Trapp, W. R. Gilley, D. S. Curtis, J. A. Cunningham and A. E. White was appointed to consider the proposal for the erection of two elevators in the city.

Norton, N.B.
The plant owned by Harmer's of this place, was recently destroyed by fire at a loss of $9,000.

Ottawa, Ont.
Thomas Smith has taken out a permit for a brick veneer building to be erected on McLeod street, at a cost of $12,000.

Orangeville, Ont.
The windmill elevator owned by Clarke & Hannah was destroyed by fire last week.

Port Arthur, Ont.
The warehouse of the C. P. R. at Port Arthur will be made 300 feet larger. Construction will probably commence shortly.

Prince Albert, Sask.
T. Baker has purchased property on Central avenue on which he will erect a large business block.

Plans are being prepared for three business blocks to be erected in the vicinity of the City Hall, for D. Agnew, Andrew Holmes and G. W. Baker.

Portage la Prairie, Man.
The C. P. R. will shortly commence the erection of a new four stall round house.

The Manitoba legislature will vote upon the matter of expending $25,000 for a new telephone building here.

Saskatoon, Sask.
Carruthers & Company will build a large warehouse this season.

Shediac, N.B.
The farmers of this district will erect a co-operative grist mill here.

Sorel, Que.
The buildings of P. E. Chevalier, A. C. Trempe, L. T. Trempe, A. Champagne, J. A. Lussier and A. Baril were destroyed by fire last week at a total estimated loss of $75,000.

Sault Ste. Marie, Ont.
The ratepayers have approved a by-law in favor of bonusing a company of capitalists who will erect a dry dock and shipbuilding yard here. According to the agreement the company will build a dry dock at a cost of $500,000, and also construct shipbuilding yards at a cost of several million dollars. In return, the town grants a bonus of $5,000 a year for twenty years.

St. Thomas, Ont.
Ireland & Killer, architects, Stratford, Ont., are preparing plans for a storage and stable for Spencer & Nimgay. The construction will be of concrete, frame and corrugated iron. Estimated cost $2,500.

Sydney, N.S.
The Dominion Iron and Steel Works will extend their plant here and will erect a large merchant mill. Other extensions are under consideration.

Toronto, Ont.
Robertson Bros. have applied for a permit to erect a $40,000 factory on Richmond street east.

It is rumored that a large hotel may be erected at the southwest corner of Adelaide and Bay streets.

Patrick Maherm has a permit for alterations to his stable at the rear of Hayden street. Estimated cost, $3,000.

The Manning Estate have obtained a permit for alterations to a warehouse at 71 Colborne street. Estimated cost $4,000.

H. H. Hiltz will build a pair of semi-detached two storey brick stores and dwellings on Broadview avenue at a cost of $5,000.

A permit has been granted to C. Pasternack and Simon Rabinovitch for a two-storey brick theatre on Terauley street to cost $15,000.

A permit has been granted to John S. Elliott for alterations to stores and offices on Church street, near Shuter. Estimated cost, $3,000.

J. B. Laidlaw will carry out alterations to his store and office at the corner of Yonge and Grenville streets. Estimated cost, $3,000.

The Copp Clark Company have applied for a permit to erect a two storey building on Wellington street west at an estimated cost of $40,000.

E. E. Rutherford has obtained a permit for the erection of a three storey brick store and dwelling on Bloor street. Estimated cost, $4,500.

It is stated that the Bank of Montreal will commence the erection, early this season, of a large new bank building at the northeast corner of Yonge and Queen streets.

J. M. Cowan, architect, 65 Adelaide street east, has prepared plans for two 2 1-2 storey stores and dwellings to be erected on Bloor street, near Bathurst street, at a cost of $5,000.

Mr. W. S. Walker, 627 Palmerston avenue, will erect a 3 storey store and dwelling on Bloor street, near Palmerston avenue, at a cost of $4,000. Jos. Walker is the architect.

Leonard Foulds, architect, 43 Victoria street, has prepared plans for a 3 storey store and dwelling to be erected on Sorauren avenue, near Wright avenue, at a cost of $3,500.

A moving picture theatre with a seating capacity of 600, will shortly be erected on Queen street east on the property recently acquired from the Globe Printing Company by Mr. Powell. The building will cost $200,000.

Preparations have commenced for the new bank building to be erected at the northeast corner of Queen and Yonge streets by the Bank of Montreal. The present tenants of the property have notice to vacate by April 1st. Darling & Pearson are the architects for the new building.

Vancouver, B.C.
The plant of the Fairview Cedar Lumber Company was recently damaged by fire at a loss of $5,000.

The proposal for the construction of St. Mark's College, at an estimated cost of $150,000, is well under way.

It is stated that the Dominion Government has decided not to erect the proposed elevators. Instead, they will be built by the C. P. R.

Local men are stated to have purchased extensive limits on the Kitsumgallum river, between Hazelton and Port Essington. A large saw mill will be erected.

An eight storey building is to be erected on the lot adjoining the "Province" office on Hastings street, at a cost of $65,000. J. S. Helyer, E. W. MacLean, J. W. Weart, and others are interested.

Douglas & Thorley have had plans prepared for the erection of a 3 storey structure on Granville street. The building will be 50 by 120 feet, and will cost about $20,000. Parr & Fee are the architects.

The Empress Manufacturing Company will rebuild their plant, recently destroyed by fire. The new building will be three storeys and basement, mill construction. Smith & Sherborne have the contract. Estimated cost, $20,000.

Welland, Ont.
The Welland Stove Works, Limited, who are making application for incorporation, contemplate the erection of a building, 140 by 48 feet, of concrete and galvanized iron construction. The capital of the concern is $40,000. The provisional directors include B. J. McCormick, Hugh Rose, W. S. Davis and E. A. Playfair.

Winnipeg, Man.
The interior of the Great West Saddlery Company's store was recently destroyed by fire at a loss of $20,000.

The Winnipeg Builders' Exchange are contemplating the erection of a new building. M. Buxton is the Secretary.

Tenders will shortly be called for the new building to be erected on the site of the old Manitoba Club by the Canada Permanent.

J. H. Russell, architect, wants tenders for general excavation work for the new building to be erected on Portage avenue by Mr. J. G. McArthur.

Tenders will shortly be called for the new garage to be erected on Maryland street near Portage avenue by the McLaughlin Carriage Company. J. D. Atchison, architect.

The contract for the erection of the head office of the Royal Bank of Canada, at this place, will be awarded shortly and the work of construction commenced as soon as weather permits.

Plans have been completed by J. G. Russell, architect, for a 12 storey fireproof office building, to be erected on Portage avenue, between the hotel and the new Nanton block, for Mr. J. D. McArthur. The work of construction will be commenced within about a month.

W. W. Blair, architect, is preparing plans for the erection of a large manufacturing building on one of the railroad lines. The specifications call for a structure 200 feet square and from four to five storeys in height. Mr. Blair is also working on plans for a large hotel.

Yarmouth, N.S.
The buildings and plant of the Burrell Johnston Iron Company were destroyed by fire last week at an estimated loss of $100,000.

AWARDED.

Cobalt, Ont.
Couture & Aubrey have been awarded the contract for a 3 storey store and office building to be erected for The Nipissing Stores Company. W. R. Graham, architect.

London, Ont.
Contracts have been awarded as follows for alterations to the London Loan & Saving Company's offices: Masonry, Scott Murick; carpentry, Tambling & Jones; painting, Lewis Bros.; vault of enamelled brick, tile floor, hardwood office fixtures, Barton Netteg, Windsor. Architect, Wm. G. Murray. Cost of improvements, $8,000.

Montreal, Que.
H. C. Stone, architect, has prepared plans for the erection of a carriage factory in Delorimier for the E. N. Heney Company, Limited.

Joseph Perreault, architect, has awarded to Lynch & Sharp the contract for the brick work for the new warehouse of the Campbell Manufacturing Company, Ville St. Louis.

Robt. Findlay, architect, has awarded to C. E. Deakin, this city, the general contract for the erection of a new warehouse and office building on Craig street west, for W. J. McGuire & Company.

Toronto, Ont.

Gratton Bros. have the contract for a 3 storey brick warehouse to be built at 145 Wellington street, for J. Stevens & Son Company. Wickson & Gregg, 59 Yonge street, architects.

J. D. Young & Son, 274 College street, have been awarded the general contract for a 4 storey warehouse to be erected on Clinton street, near College street, for the Imperial Storage & Cartage Company, Limited. The building will cost $20,000.

Power Plants, Electricity and Telephones

Brantford, Ont.

The Street Railway Company have entered into a bond to carry out the double tracking and improvements, as outlined in the city's agreement, this summer.

The city council has completed an agreement with the Cataract Power Company for the supply of lighting for a short term to this city. The price for street lighting is close to $47.50 per arc light per annum, and 7 1-2 cents per kilowatt for commercial and industrial lighting.

Brandon, Man.

The Maple Leaf Milling Company may put in an entirely new power plant. Mr. J. S. Barker is general superintendent of the company.

Calgary, Alta.

The Calgary Power & Transmission Company have engaged Cecil B. Smith, consulting engineer, Toronto, to report on their power proposition at Horseshoe Falls on the Bow. Mr. Smith states that this fall alone will produce at least 8,000 horse power.

Cumberland, B.C.

The British Columbia Telephone Company will install a system here.

Gravenhurst, Ont.

The bylaw to raise $15,000 for the purpose of completing the expenditure undertaken in the construction of the Hydro-Electric power plant at South Falls, has been approved by the ratepayers.

Guelph, Ont.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until March 17th for electric fixtures for the armory. Plans and specifications may be seen at the office of W. Mahoney, architect, Clerk of Works, Guelph, and at the Department of Public Works, Ottawa.

London, Ont.

In his report to the special power committee of the City Council, the City Electrical Engineer, Mr. E. I. Sifton, advises the construction of a civic power plant rather than purchase the plant now under consideration, the figure for which is stated to be excessive. A consulting engineer will be called in to verify the report.

Moncton, N.B.

The Acadia Telephone Company are applying for incorporation to construct and operate a telephone system in Kent and Northumberland counties. A. A. Richard, J. T. Lambert, Rev. J. Dufour and others are interested.

Nelson, B.C.

The City Council have accepted the offer of the Electric Tramway Company to buy out the plant at the sum of $10,000. No cars have been in operation since the car barns and rolling stock were destroyed by fire last May.

The Electric Tramway Company have purchased the municipal plant for the sum of $10,000.

Orangeville, Ont.

Tenders will be taken in the course of a month by Smith, Kerry & Chace, consulting engineers, Confederation Life Building, Toronto, for the construction of the power house for the Dufferin Light & Power Company. The power house will contain three 150 k.w. hydraulic units with step-up transformers to a transmission voltage of 22,000 volts.

Port Arthur, Ont.

Tenders close March 10th for the supply and delivery of the following material f.o.b. Port Arthur: 2,000 pounds 5 1-2 by 9-16 spikes; 700 pounds 3 1-2 by 3-4 track bolts (square nuts); 60 tons 60-pound standard T rails. J. McTeigue, Secretary, E.R.L. & T. Commissoiners.

Toronto, Ont.

The bill to incorporate the Eastern Ontario County Electric Belt Line Company, capitalized at $1,000,000, is now before the Provincial Government. The company proposes to build an electric line from Lancaster township, running along the St. Lawrence to Cornwall, thence to Brockville, thence northwesterly through to Dundas and Lanark to Darling township, passing through Athens, Lanark, Perth, and connecting with the Lanark Counties Electric Railway Company, and from Morrisburg through Dundas, Russell and Carleton.

Vancouver, B.C.

City Electrician McCulloch has completed specifications upon which tenders will shortly be called for a police signal patrol system.

Winnipeg, Man.

It is stated that the Canadian Northern Railway is preparing to electrify its shops here, using power from the street railway plant.

AWARDED.

Calgary, Alta.

The City Commissioners have awarded a contract for four modern street railway cars at $4,875 each, to the Car & Coach Company, Preston, Ont. The Ottawa Car Company obtained a contract for eight of a similar type at the same price.

Edmonton, Alta.

Contracts have been awarded by the Street Railway Company, as follows: Federal Electric Company, Montreal, Que., aluminium, contract price, $4,500. The nearest competitor was the Northwest Electric Company, of Edmonton, whose price was $50 lower. The Northwest Electric Company will furnish the overhead specials for $1,947.90. Wm. Stuart & Company will supply the wooden poles needed for $3,400. Copper bonds will be supplied by the Canadian General Electric Company, Peterborough, Ont., for $5,070.

Montreal, Que.

The G. T. R. have received an order from the Southern Counties Railway Company for the construction of six electric train cars, for use on the service across Victoria bridge.

Moncton, N.B.

The Canadian General Electric Company, Toronto, have been awarded the contract for electrical supplies for the city. The contract for cross-arms was given to the Paul Lee Company, Limited, and the tender of The Sumner Company for cedar poles was accepted.

St. John, N.B.

The contract for the construction work involved in the hydro electric development of the Grand Falls Power Company on the St. John river at Grand Falls, has been awarded to the Frank B. Gilbreth Company, of New York. John J. McRae, of Ottawa, Ont., is the chief engineer, and Ralph Mershon of New York, is the electrical engineer. This plant will generate 100,000 horse power in electric current, which will be furnished to the various towns throughout New Brunswick. The work involves, among other features, the construction of a number of shafts in rock excavation 130 feet deep, a power chamber 30 feet by 260 feet and 130 feet deep, and a tail race tunnel 28 feet in diameter and 2,400 feet long, a power house 350 feet long and 260 feet wide. The intake shafts will be nine in number and 12 feet in diameter, 130 feet deep. The plant will be equipped with modern hydraulic and electrical machinery for high potential and long distance transmission. Actual construction will be begun immediately and will be pushed through to completion at an early date. The estimated expenditure is in excess of $5,000,000.

Miscellaneous

Arthur, Ont.

Tenders for debentures, amounting to nearly $14,000, will be received until March 15th by D. T. Small, Clerk, this village.

Brandon, Man.

Tenders for supplying the city with Portland cement for the coming year will be received until April 16th by Harry Brown, City Clerk. (See advertisement.)

Fredericton, N.B.

Tenders addressed to John Morrissy, Chief Commissioner, Department of Public Works, Fredericton, will be received until March 22nd for the construction of the concrete sub-structure and approaches of Hartt's bridge over the Oromocto river, near this place. Plans and specifications may be seen at the Department of Public Works, Fredericton, and at the local government rooms at St. John, N.B. Tenders will also be received by Mr. Morrissy until April 5th for the construction of three metal superstructure spans over the Oromocto river. Plans and specifications at the Department.

Guelph, Ont.

Tenders addressed to T. J. Moore, City Clerk, will be received until March 11th for the purchase of the following 4 1-2 per cent. debentures of this city: $62,703.46 for pavement of Wyndham street and St. George's Square, maturing in twenty years; $2,453.02 for pavement of Douglas street, maturing in ten years.

Ottawa, Ont.

Tenders addressed to Charles Macnab, County Clerk, will be received until March 15th for the purchase of $20,800 debentures of the county of Carlton.

Toronto, Ont.

The Island Committee of the City Council have decided to ask the Board of Control to advertise for tenders for a new dredge.

Tenders and For Sale Department

Canadian Agents Wanted

A British firm manufacturing Tiles, Mosaics, Faience, Terra Cotta, etc., wants Canadian agents in Toronto, Winnipeg, Montreal and other large cities. Correspondence confidential. Box 140 CONTRACT RECORD, Toronto. 12

Business For Sale

An electrical contracting business in good Ontario city is offered for sale. Good local connection. Owner has another proposition in view. Address Box 141, CONTRACT RECORD, Toronto. 10

Draftsman Wanted

Capable, reliable architectural draftsman accustomed to high class work. Full particulars as to experience and salary to

HERBERT E. GATES, Architect,
10 Telephone Building, Halifax.

Applications Wanted

Applications will be received at the office of the undersigned and marked "Application for City Engineer" up to and including TUESDAY, THE 23RD OF MARCH, 1909, until 5 o'clock p.m.

J. H. TRUSDALE,
City Clerk.

Saskatoon, Sask., Feby. 15th, 1909. 10

Temiskaming and Northern Ontario Railway Commission

Sealed tenders addressed to the undersigned and marked on the envelope "Tender" will be received up to 12 o'clock noon on WEDNESDAY THE 17TH MARCH for the following works:—

1. **Engine House and Machine Shop at Cochrane.**
2. **Locomotive Foreman's Office and Petty Stores Building at Cochrane.**
3. **Heating Plant for Cochrane Roundhouse and Machine Shop.**
4. **One 75 ft. Turntable complete at Cochrane.**
5. **Coal Shed and Trestle at Cochrane.**
6. **Culvert near Mileage 22½.**
7. **5 ft. Arch Culvert near Mileage 50¼.**
8. **20 ft. 1 Beam Span near Mileage 62½.**
9. **20 ft. re-inforced Concrete Arch Culvert near Mileage 222½.**
10. **One 8 ft. re-enforced Concrete Arch Culvert near Mileage 221.**
11. **One 11 ft. re-enforced Concrete Arch Culvert near Mileage 218½.**

Plans and specifications may be seen at the office of the Secretary-Treasurer, 25 Toronto St., Toronto, or at the office of the Chief Engineer, North Bay.

Forms of tender and amount of deposit necessary in respect of each item can be obtained on application to the Secretary-Treasurer at above address.

Lowest, or any tender, not necessarily accepted.

A. J. McGEE,
Secretary-Treasurer.

25 Toronto St., Toronto,
February 22nd, 1909.

Papers inserting this advertisement without authority will not be paid for same. 11

City of Brandon

Tenders for Cement

Sealed tenders, endorsed "Tenders for Cement," will be received by the undersigned until 4 o'clock, p.m., FRIDAY, APRIL 16TH, 1909, for the supply of One Thousand to Two Thousand Barrels of "Portland" Cement, for the City of Brandon for the coming season. Specification and form of tender may be obtained on application to W. H. Shillinglaw, City Engineer, Brandon.

The lowest, or any tender not necessarily accepted.

HARRY BROWN,
City Clerk.

Office of City Clerk, March 4th, 1909. 9

City of Calgary

Tenders will be received by the Commissioners of the City of Calgary, addressed to the undersigned, marked,

"Tenders for Sewer Pipe or Water Pipe"

up to 4 p.m. of the 22ND DAY OF MARCH, INST., for supplying the City of Calgary with the following:

Sewer Pipe—Single and Double Stength

4″ ft.	6″ ft.	8″ ft.	9″ ft.	10″ ft.
26,000	8,250	2,416	3,100	13,270

12″ ft.	18″ ft.	20″ ft.	24″ ft.	30″ ft.
8,400	5,480	2,200	5,246	9,200

Specials—Ys, Ts, and Bends

1,250	350	100	125	700	350	250	100	220	400

Water Pipes—All Sizes

6″ Pipe	12″ Pipe
41,140 Lin. ft.	5,000 Lin. ft.

The Commissioners do not bind themselves to accept the lowest, or any tender.

H. E. GILLIS,
City Clerk.

Dated at Calgary, March 1st, 1909. 12

Town of Fort Frances

Ontario

Tenders Wanted

Sealed tenders will be received by the Town Clerk until 8 p.m on THURSDAY THE FIFTEENTH DAY OF APRIL, 1909, for certain materials for Water Works and Sewerage Works as follows:

Contract "A"	**All labor necessary for constructing the water works distribution system and certain materials therefor.**
Contract "B"	**All labor for constructing sewerage system and certain materials therefor.**
Contract "C"	**The supplying of cast iron pipes, and special castings.**
Contract "D"	**The supplying of gate valves and hydrants.**
Contract "E"	**The supplying of vitrified tile pipe.**
Contract "F"	**The supplying of manhole covers, etc.**

Plans and specifications may be seen at the office of the Town Clerk, Fort Frances, also forms of tender may be had on application to the Town Clerk.

W. H. ELLIOT,
Town Clerk.

H. WILLIAMS, Esq.,
Mayor of For Frances. 12

Wanted

Good practical man familiar with the manufacture of cement blocks, tile and other cement products. State experience, salary and give references. Apply P. O. Box 1030, Brockville, Ontario. 10

Tenders

will be received up till 5 o'clock MONDAY, MARCH 22ND, for all trades required in the erection of a building for the Faculty of Education, Univercity of Toronto, corner of Bloor Street and Spadina Avenue. The lowest or any tender not necessarily accepted.

DARLING & PEARSON,
10 Architects, Toronto.

Town of Weyburn

Province of Saskatchewan

Tenders Wanted

Sealed tenders will be received by the Secretary-Treasurer of the Town of Weyburn until

8 p.m., on Wednesday, April 7, 1909

for the following sections of proposed System of Water Works:—

"A" Pipelaying
"C" Water Tower
"D" Cast Iron Pipes
"E" Fire Hydrants and Valves

Plans and specifications may be seen at the office of the Secretary-Treasurer, Weyburn, or at the office of the Chief Engineer, Toronto, on or after March 8th.

SAMUEL MURRAY, Esq.,
Chairman W. W. Committee,
Weyburn, Sask.

J. R. FOX, Esq.,
Mayor,
Weyburn, Sask.

GEORGE ROSS, Esq.,
Secretary-Treasurer,
Weyburn, Sask.

WILLIS CHIPMAN, C.E.
Chief Engineer.
103 Bay St., Toronto, Ont.

10

In planning stairways, care should be taken to have sufficient room so that the height of the riser is not too great. The distance from floor to floor in inches should be divided into a certain number of vertical distances, each of which is termed the rise and which is usually from 7 to 8 inches. A rule frequently applied in proportioning the rise to the width of the tread is, that the rise in inches multiplied by the run or tread in inches shall be about 70 or 75. According to this a 7-inch riser will call for a 10½-inch tread. The workman will readily see from this rule that the greater the rise the less the run, and the less the rise the greater the run, the proportions varying to suit different conditions.

The capital stock of the Bitulithic and Contracting Company, Limited, has been increased by letters patent from $150,000 to $200,000.

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Canada and Great Britain - -	$2.00
United States and Foreign - -	2.50

Vol. 23 Toronto, March 10, 1909 No. 10

An Historic Event for Canadian Cement

The holding of the first annual exhibition and convention of the Canadian Cement and Concrete Association in Toronto last week was an event which will beyond doubt mark an era in the history of the industry in Canada. It was a most progressive idea to hold such an exhibition at the present time. The cement industry in Canada has just emerged from a period of depression which has been a testing time for all concerned. The air is cleared now for improvement in trade and the cement industry will receive a good impetus in the direction of renewed activity and prosperity by the holding of the exhibition. At the present time it is not necessary to present any arguments in favor of the holding of trade conventions. They have come to be recognized as one of the best methods conceivable for furthering the interests of those who take part in them. They have also become a feature of modern business methods, and the man who ventures to cast any doubt upon them finds himself in a weak minority.

The benefits of such meetings were never more forcibly demonstrated than in the present instance. It resulted in an awakening of trade activity which will surely be of material assistance during the present year. It should have a decidedly favorable effect upon the volume of trade effected by those who took part. There were a few doubters before the exhibition, but they have been converted, and it is safe to say that at the next exhibition there will be a shortage of space for exhibitors, unless an unusually capacious place can be found for holding it. The choice of Toronto as the place for holding the meetings was a good one. Toronto is centrally located and is a city where cement is becoming daily more popular. It would be well, however, to have the choice fall upon some other place for next year. There is much in favor of the policy of moving the exhibition and convention to different cities from year to year. Cement is a building material of universal use and its value cannot be proclaimed too widely. For this reason and for the sake of enlarging the interests of the association it would be well to hold the meetings somewhere else than in Toronto next year. Several expressions of opinion have already been heard upon this subject and there seems to be a fairly general belief that Montreal would be the best place for the 1910 exhibition and convention.

Those who were instrumental in the success of the exhibition and convention deserve much praise. They have done a splendid bit of pioneering and have done it in an unusually thorough manner. Their efforts should be backed up by all who are interested in the industry, so that having made so good a beginning the association may be enabled to do even better in the future. The convention feature of the meeting was a remarkable success. Those who delivered addresses or read papers showed that they were not only thoroughly well versed in their subjects but enthusiastic as well. The range of subjects covered and the thoroughness with which they were handled would have been a source of congratulation for an organization of much greater age and standing than the Canadian Cement and Concrete Association. One of the interesting features of the exhibition was the large number of exhibitors from the United States, who showed their faith in the future of the industry in Canada.

An Architect's Legal Protection

A case of much interest to architects came before the Court of Appeal for Ontario recently. The matter at issue in the case, which was that of Erb v. Dresden Public School Board, was the payment due for services rendered in the preparation of plans and specifications for a new public school building. The school board had failed to make payment because it was claimed that it was beyond their power to make expenditures on plans and specifications, and therefore any agreement they might have made for such work was not binding upon them. This view was taken by Judge MacMahon at the original trial and when the case came up on appeal the decision was reversed by Judge Britton.

It is fortunate that this judgment has been given by the Appeal Court, as, if the law were as it was interpreted by the lower court, it would mean that there would be no security for achitects who took commissions from school boards. Judge Britton not only held that school boards were competent to give commissions of this class, but that they were a necessary pre-requisite to building and even to an application to a municipal council, and to submitting a by-law to the people. The ratepayers were entitled to know what class of building they were being asked to pay for, and it was the duty and certainly within the power of the trustees to obtain and submit plans and specifications.

It would be a dangerous condition of affairs if a body such as a school board, which everybody supposes has the right to enter into engagements of this nature, were not entitled legally to do so. The door would be left open for much misunderstanding and a fruitful source of litigation would be provided without any corresponding public benefit. The difficulties which can arise over the business affairs of an architect are already numerous and complicated enough, and it would be a blunder if they were made unnecessarily more so. Judge Britton also fixed the amount due to the architect in this case and held that the ordinary percentage basis should not apply as the building was a large one, but quite plain.

Cement Convention and Exhibition

First Annual Meeting a Splendid Success — Many Excellent Addresses Delivered—Interesting Show at St. Lawrence Arena

The first annual Canadian Cement and Concrete Exhibition, which was held in the St. Lawrence Arena and at the King Edward Hotel, Toronto, last week, was one of the most successful, inaugural undertakings of its kind which has ever been held. It afforded, above all, a splendid illustration of the fact that the cement industry has not only come to stay in Canada, and that it has made remarkable advances within the last few years. There were no fewer than sixty-two exhibitors from both Canada and the United States, and a great number of people attended and gave evidence of the interest which is taken by the public in this building material.

The President's Opening Remarks

President Gillespie, in opening, said:. "I have much pleasure in opening the first convention of the Canadian Cement and Concrete Association, which was organized about a year ago. Its aims and purposes are to extend a knowledge of cement and concrete and reinforced concrete, and to direct the attention of possible users to the application of these materials in construction. Also to provide opportunities for meetings from time to time at which scientific and practical subjects bearing on the application of these materials in construction will be discussed. Also to provide for the publication from time to time of literature as it may seem advisable. We have two or three precedents for our organization—the great Institute of Great Britain, embracing in its constitution 500 architects and engineers, the most eminent in the British Islands. That organization's president was the Right Honorable the Earl of Plymouth, the late Minister of Work in the Imperial Government service. One of the vice-presidents is Sir Douglas Fox, one of the past presidents of the Society of British Engineers, the most influential organization of its kind in the British Empire. This organization hopes to popularize the uses of cement and concrete, and other products in the line of this material, and it is thought that to hold an exhibition and convention from time to time will accomplish this end. You will find on the floor of this hall this evening a large number of very fine exhibits, over 60 in number, comprising cement products, machinery, and various appliances necessary in their manufacture; and, I think, it is a compliment to the enterprise and ingenuity of the manufacturers in the United States as well as Canada, because many of the exhibitors here are from across the line, and they have shown sufficient interest in this convention to come and display their exhibits. We have with us this evening Hon. Dr. Reaume, the Minister of Public Works for the Province of Ontario, representing what, I think is the most important part of the provincial service, and I am glad to know that he takes a more than superficial interest in that material which is attracting so much attention in the industrial world. I have much pleasure in calling upon him to open the exhibition."

Hon. Dr. Reaume, Minister of Public Works, spoke at some length of the history of the Cement Industry and referred particularly to the fact that cement was being more largely adopted by the Ontario Department of Public Works than was ever the case before. Last year the Department had built three bridges of concrete over the Spanish River at a cost in the neighborhood of $70,000. They were now preparing estimates for the construction of a large number of bridges. It might cost a little more for the time being, to adopt this policy, but the department was determined to give to the people of Ontario only the best and most permanent class of public works. He was glad to see that the country at large was adopting the use of cement for bridges, barn foundations, concrete floors, pavements, etc. Cement blocks were particularly noiseless, durable and extremely serviceable At the present time the Government was contemplating the building of four or five large dams for storing water powers, and the Department of Public Works was figuring on cement as being the most permanent and enduring material that could be used.

Those who were interested in the cement industry ought to unite and work hand in hand for its welfare. They should take particular care that they employed good men, good mixers and honest men. A great deal of the fault found with cement was generally due to bad mixing and dishonest work. However, he might say also that sometimes some of the cement men were not altogether blameless. It was the duty of the department to visit the different towns and examine the cement works, and he had seen instances of failure which had not always been due to the mixing, but to cement, which was not clean.

The cement manufacturers of Canada were attending the exhibition, not only for the purpose of self-adoration. They were present for the purpose of self-protection and to encourage the industry. They should not allow themselves to be outdone by their American friends. They liked to see them taking an interest in the Canadian industry but after all they were anxious to have Canada for the Canadians and to get a large share of the cement business for themselves.

Dr. Reaume referred to the building of the tunnel between the United States and Canada under the Detroit River. He mentioned with regret the fact that so much American cement had been used upon this work, and said that the reason given was that good clean cement could not be obtained in Canada, and had to be imported. He hoped Canadian producers would always be ready to produce good, clean cement and that no such remark could be made with justice about Canadian cement. Cement was a good building material and it was the duty of the members of the association to foster the industry and if they did so they would certainly reap a great reward.

Dr. Reaume then declared the exhibition officially opened and with a screeching of whistles the exhibits commenced to operate. The balance of the evening was devoted to visiting the various booths. The attendance was good, and Dr. Reaume and Hon. W. J. Hanna, Provincial Secretary for Ontario, visited practically every booth in the exhibition and took a great interest in all the materials.

The Convention

The convention which was held in connection with the exhibition was opened by an executive meeting at the King Edward Hotel, on the morning of Tuesday, March 2nd. In the afternoon, at 2.30 o'clock, Dr. Galbraith, Dean of the faculty of Applied Science and Engineering of the University of Toronto, delivered the opening address. Dean Galbraith indulged in a number of reminiscences. He said that fifteen years ago, such a show as the present one would not have been possible in Canada. The expansion in the cement industry in recent years had been very great. The returns showed that in 1908 something like 2,000,000 barrels of cement had been produced in Canada, as compared with 2,400,000 barrels in 1907. This was a slight falling off, but it was to be accounted for by the depression which had prevailed throughout the North American continent. There was no doubt that the cement plants, both in Canada and in the United States, were now prepared to turn out possibly one third or one-quarter more than what they were at present turning out. They might not expect, therefore, to see any very great increase in the construction of cement factories, but might hope for investigation, for invention and for the development of methods to make better use of what they had already, so that when the time came to spend money, these efforts might bear fruit. It was always in times of depression that opportunities arose for studying, and during such times they would expect to see the inventions and improvements which would come into effect in the future.

Dean Galbraith's Reminiscences

"Long ago," said Dean Galbraith, "I remember being interested in concrete. I was a contractor's engineer once on the Intercolonial Railway in the early seventies, and I remember then that we were about to get dimensions for the Millstream bridge on the Matapedia River. It was a question with the contractor whether he should not make the piers and abutments of the bridge of 'artificial stone,' as we called it then, instead of natural stone. He set me to work and I manufactured a concrete block of Portland cement about the size of the ordinary dimension stone in the abutments of the bridge, and taking all the care possible with it, put it into the form and put it out into the river in the fall and let it remain there until the spring, to find how it would stand the action of the ice and the water. I suppose my concrete making was not very good. However, then we had not Portland cement such as we have to-day. It was an imported cement which we obtained from England. That block, in the spring, was cracked, worn and so on to such an extent that we did not think artificial stone was the proper material for the building of bridge piers and abutments.

"On another occasion I spent a few months in Boston while the offtake sewers were being constructed. Mr. Elliott C. Clark was the chief engineer of that work and I spent a good deal of time trying to learn a little about Portland cement there. That was in 1883. What makes me remember that distinctly is that it was the first time that I had heard the theory that Portland cement owes its strength, or the amount to which it can take up sand, to its fineness. They had been importing Portland cement at that time to a great extent, and had also used some American cement. I believe that fact is still considered to be fundamental in the manufacture of cement, namely, that it owes its strength to its fineness.

"Little things like these stick in one's mind, especially at a time like this, when such immense advances have been made in the theory of the manufacture. Now we see cement advancing one might say, if it is proper to say that of a thing like cement, by leaps and bounds. We have had it used, of course, for mortar for ordinary masonry, for foundation work. These are perhaps its first uses, but now it is going into everything. We have, of course, culverts, and we have had, to some extent, railway ties. I have even heard of a proposition to make telegraph and telephone poles of reinforced cement. All these advances, and especially the advance due to reinforcement, will, no doubt, establish for the cement and concrete industry a very great future. We are only, I think, at the beginning of finding the uses for cement. It is certainly a very peculiar substance in itself. There is nothing else like it that we know of."

Dean Galbraith then considered the various methods of testing structural materials, referring particularly to the wet and the dry methods, both of which were applicable to cement. This fact was greatly in favor of cement. When they had a substance, which was not like cast iron, which permitted the dry method of testing only, but which could be tested by both the dry and the wet method, and gave sufficient time to work out its test, and which had the strength and elasticity and the toughness required for nearly all structural purposes, no one could wonder that inventors were going to stick to such a material and find out what could be done with it The investigations now going on would, no doubt, bring cement before the public more than ever. There was no doubt at all that while cement was a non-combustible substance and in that sense fireproof, it was not altogether certain how lasting cement materials would be under fire. They had had the tests of a great many buildings, especially in Baltimore and other places, to show that cement would hold its own under fire better than stone and possibly better than, or as well as, brick. There was no doubt at all that if the public generally became convinced of the fireproof qualities of concrete it would lead to a great increase in its use.

"To my mind," said Dean Galbraith, "the two structural materials that are of the greatest importance to the engineer and the manufacturer and builder of the present day are steel and cement. With these two we can do what we never did before. We can greatly economize in the use of wood, and you know what has been said on this subject. It is said that the value of our country will depend very largely on the conservation of the forests, on the holding and staying of the water near the heads of the streams, instead of allowing them to go off suddenly and inundate the surface. Forest conservation is possibly at the root of a great deal of our future prosperity and there is no doubt that the cement industries will aid in that and will have a very great effect in helping forest conservation." Dean Galbraith concluded with a reference to the interest which was taken in the study of cement and concrete at the University of Toronto.

The Association's Purposes

President Gillespie in his opening address stated what in his opinion were the principle ways in which the association might be of use to its members. First of all it ought to be a source for the dissemination of valuable information in the form of contributions from its members and others upon the manufacture, use and testing of cement. It could be of assistance by adopting as an organization the specifications which other reliable organizations had evolved, or by creating other specifications better adapted to the conditions of the country. It might assist in the standardization of methods of testing and might become a clearing house for the ideas and experiences of manufacturers, users, engineers, architects and chemists. To publish authentic information would be one of its prime functions. Reciprocity in ideas ought to be the watchword of the organization. Mr. Gillespie concluded by suggesting the establishment of an institution similar to the United States Structural Materials Testing Laboratories at St. Louis, where the facts relating to structural materials could be investigated according to progressive ideas. Such an institution would be a source of the greatest possible advantage to Canada.

The next event was the delivery of an address by Mr. William M. Kinney, assistant inspecting engineer of the Universal Portland Cement Company of Chicago, entitled "Why Sidewalks Fail."

On Tuesday evening the convention programme was opened with an interesting address by Mr. J. E. Moore, inspecting engineer for Robert W. Hunt & Company, Chicago, who spoke upon "Tests and Inspection of Cement." Mr. Moore's address will be reported in detail in a later issue of the "Contract Record."

An interesting address upon "Concrete Bridges" was then delivered by Mr. Frank Barber, engineer for the County of York. Mr. Barber's address will be reported in detail in a later issue of the "Contract Record."

Mr. H. B. Gordon, on behalf of the Ontario Association of Architects, was present and made a brief address. He dealt forcibly with the problem which now confronted the architects. While he had been looking at the photographs which were thrown upon the screen for some of the addresses he had not been able to avoid feeling that, after all, the designs were not suitable for concrete. They should have something which in some way would give the idea of stability, of density, and of power. Thus it was up to the architects to get their thinking caps on.

Mr. J. Augustine Smith, of the Ideal Concrete Machinery Company, South Bend, Ind., also delivered an interesting address upon "Concrete Blocks," on Tuesday evening. Mr. Smith illustrated his address with a number of excellent lantern views which showed how effectively concrete blocks can be used in buildings of every description. He gave a number of interesting facts regarding the manufacture of concrete blocks and predicted that they were certain to increase in public favor.

On Wednesday the convention programme included the following addresses: "Portland Cement Mortars," A. G. Larsson, chemist, Grey & Bruce Portland Cement Company, Owen Sound, Ont.; "Designing and Testing of Reinforced Concrete Beams," E. Brown, associate professor of Applied Mechanics, McGill University, Montreal, Que.; "Twenty Years' Experience in Cement Walk Building," C. W. Cadwell, manager Cadwell Silex Stone Company, Windsor, Ont.; "Modern Methods of Waterproofing Concrete," Lucius E. Allen, Ontario Limestone & Clay Company, Belleville, Ont.; "Reinforced Concrete Design from the Standpoint of Practical Engineering," A. W. Burge, Trussed Concrete Steel Company, Toronto; "Field-Made Concrete," Walter J. Francis, consulting engineer, Montreal; "The Use of Cement in Municipal Work," A. W. Campbell, Deputy Minister of Public Works, Province of Ontario; "Reinforced Concrete in Building Construction," Emile G. Perrott, architect, Philadelphia, Pa.; "Ornamental Concrete Stone," Fred A. Norris, consulting engineer, Boston, Mass.

On Thursday afternoon the programme included the following addresses: "Artistic Concrete Bridges," C. R. Young, lecturer in Applied Mechanics, University of Toronto; "Factory-made Concrete Building Products," "Address," Merrill Watson, general sales manager, Consolidated Expanded Metal Companies, New York.

Mr. Edmund Burke, Toronto, delivered a brief address on behalf of the Architectural Institute of Canada.

The First Annual Banquet

On Thursday night the first annual banquet of the Canadian Cement and Concrete Association was held in the banquet hall of the King Edward, and proved highly successful, being attended by about 100 guests. The president, Prof. Gillespie, occupied the chair, and the toast list was brightened with brief and snappy speeches. Mr. A. W. Horn responded to the toast of "Canada," and Mr. Merrill Watson, New York, Mr. J. Augustine Smith, of South Bend, and Mr. Thomas Dates, of Owen Sound, replied on behalf of "The Industry," proposed by Dean Galbraith. Mr. Ivan Macdonald toasted "The Men Who Specify," and Messrs. W. J. Francis and M. Morssen, of Montreal, and Mr. J. G. Langton, Toronto, responded. Mr. J. G. Murphy proposed "The Guests," coupling with it the names of Messrs. Sandford E. Thompson, of Newton Highlands, Mass., and J. E. Moore, of Chicago. "Municipal Interests" were proposed by Mr. James Pearson and Messrs. Chamberlain (Belleville), Griffin (Buffalo), and Blanchard (Toronto) made short replies.

Friday afternoon's programme included the following addresses: "Factory-made Concrete," M. Morssen, consulting engineer, Montreal, Que.; "The Evolution of Concrete in Municipal Engineering," Mr. A. C. Blanchard, Sewers Engineer, City Hall, Toronto; "Selection of Concrete Materials," Sanford E. Thompson, consulting engineer, Newton Highlands, Mass.

Exhibition Notes

The Belleville Portland Cement Company had a neat exhibit in charge of their Toronto representative, Mr. Chamberlain.

The Hamilton Pressed Brick Company had some of their product on display. This firm's brick is reported to be meeting with wide favor among architects and contractors in all parts of the country.

The Schultz Bros. Company, Limited, of Brantford, showed their silica pressed brick which, being a comparatively new building material attracted considerable attention. The Brantford firm have supplied their product for a large number of prominent buildings and the demand is reported to be rapidly increasing.

Nothing in the whole show attracted more attention than the fireproof doors, windows, etc., shown by A. B. Ormsby, Limited. They have an attractive series of literature, which was widely distributed, and will doubtless have a satisfactory educational effect. This firm have the satisfaction of knowing that their goods have proved their worth in several big fires.

The Brantford Roofing Company, Limited, Brantford, Ont., had on exhibition the various brands of the well known "Brantford Roofing." A particularly interesting part of their exhibit was a sample showing the application of rubber roofing to concrete roofs. The rubber roofing is put on by means of a level surface roller, and in conjunction with the concrete makes a roof that is perfectly rain proof, and will stand all degrees of heat or cold.

In the interesting criticism of a peculiar septic tank system, which was contributed by Mr. T. Aird Murray to the "Contract Record" and was published in the issue of March 3rd, a misprint occurred which gave an incorrect version of the subject. In the criticism of paragraph G, relating to the length of time taken for scum to form on the surface of the sewage in the tank in question, the following oppeared: "See Hamburg Experiments, page 85—'It takes two minutes on the average for scum one-half inch thick to form, from household sewage.'" This should have read, "It takes two months," etc.

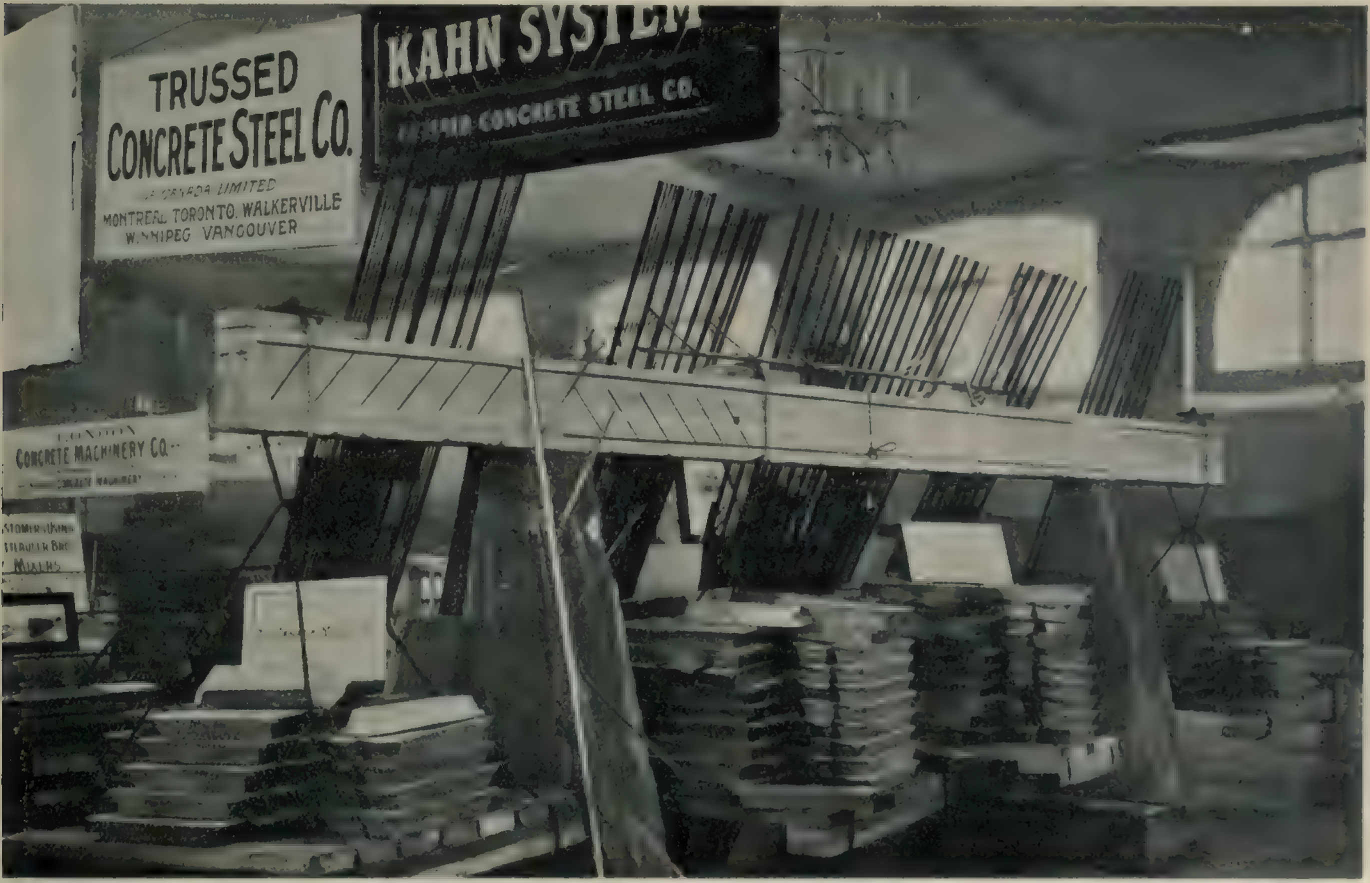
Among the Exhibitors at the Cement Show

Excellent Display of Materials, Products and Machinery, Representing Every Branch of the Industry

The exhibition which was held in the St. Lawrence Arena, Toronto, in connection with the first annual exhibition and convention of the Canadian Cement and Concrete Association, was a most successful one. Visitors obtained, in an incredibly short space of time, a liberal education regarding all the manufacturing processes, and the innumerable uses of cement and concrete. Several who had attended the recent exhibition at Cleveland, Ohio, had no hesitation in saying that although the Toronto exhibition was not so extensive as the Cleveland one, it far surpassed the latter at to quality. The exhibits were certainly of an extremely comprehensive nature, and their arrangement reflected great credit upon those who got them up. They showed much originality of treatment and a great amount of artistic ability. The most noticeable feature of the exhibit was its wide range. One could see at a glance from almost any part of the Arena, exhibits of the raw material from which cement is produced, of the machinery by which it is compounded with stone, sand and gravel to make concrete; of the reinforcements used for making reinforced concrete; of concrete blocks and of buildings erected of artificial stone. Not only were cement and concrete materials shown in great variety, but there were other building materials, such as glass, brick, metal lumber, etc., and one enterprising firm displayed a wide range of splendid waterproof shoe dressings.

Kahn System of Reinforced Concrete

The Trussed Concrete Steel Company had one of the most unique exhibits in the Arena. This consisted of a beam of concrete reinforced with two ¾-inch by 2-inch Kahn bars in the bottom to take the centre load of four tons which was suspended at each of the third points. The beam was eight inches wide by twelve inches deep, with a span between the supports of twelve feet from centre to centre. The cantelever at the end of the beam was 3 feet 6 inches long, and was reinforced by two ¾-inch by 2-inch Kahn bars. It carried a cantelever load of two tons at each end. In addition to this exhibit the company also showed several photographs of buildings which had been constructed with their materials and a number of their metal products for lintels, rails, beams, etc. They also had several specimens of their expanded metal, rib lath, and Hy-rib lath on exhibit. Their exhibit was rendered additionally attractive at night by the presence of a large electrical sign.


TRUSSED CONCRETE STEEL CO.
OF CANADA LIMITED
MONTREAL TORONTO. WALKERVILLE
WINNIPEG VANCOUVER
KAHN SYSTEM
TRUSSED CONCRETE STEEL CO.
CONCRETE MACHINERY CO.

The Trussed Concrete Steel Company's Exhibit of Their System Under Test.

The Rogers Supply Company's Exhibit

The Rogers Supply Company, 3 King street east, Toronto, had one of the most attractive exhibits in the Arena. The progressiveness of this company was well evidenced by the fact that its exhibit, which consisted solely of the Hadsel Mixer, was the centre of an interested throng during every day of the exhibition. This was accounted for partly by the interest naturally taken in this machine and also by the fact that the Rogers Supply Company left no stone unturned which would assist them in letting the public know the merits of the Hadsel Mixer. At an early stage of the exhibit they sent out a number of telegrams and letters to prominent contractors and corporations telling them that all the principal mixers were on exhibition in the various booths, and inviting them to come as their guests to the exhibition and inspect the mixers and make their own comparisons. This resulted in a number of prominent contractors and others availing themselves of so favorable an opportunity. During one afternoon alone, there were among those who examined the Hadsel Mixer the following, who took the greatest interest in its details: Representatives of the C.P.R., G. T. R., T., H. & B. Railway Company, the Dominion Power and Transmission Company, J. G. Sing, of the Dominion Public Works Department, Toronto; the City Architect of Toronto; R. Weddell, Trenton; J. R. Stewart, Town Engineer, Renfrew; F. T. McArthur, City Engineer, Guelph; Dr. McElhenny, Ottawa; C. G. Millard, Coldwater; Ira New, Belmont; John Anderson, Building Inspector, Hamilton; C. E. Rapson, Woodstock; F. Bartlett, Peterboro; P. H. Fair, Kingston; W. H. Yates, Preston; Geo. Patterson, Preston; T. T. Black, C.E., Toronto; S. B. Chadsey, B.A.Sc., of the Canadian Laboratories, Toronto; J. L. Stuart, mining and civil engineer, Toronto; Mr. Turner, Cobalt; W. Grunday, Union Stock Yards, Toronto Junction; Wm. Clarke, contractor, Owen Sound; F. H. Herbert, architect, Toronto; A. K. McNair, Toronto; B. Gibson, Toronto; Mr. Godson, Toronto; Hill & Clark, contractors, New Liskeard. These were only a few of the many who evinced their interest in the exhibit. The exhibit was in charge of Mr. P. G. Rimmer and Mr. A. D. Hadsel, of Wilkesbarre, Pa., and A. Rogers and J. Duffy, of the Rogers Supply Company, Toronto.

The Rogers Supply Company's Exhibit of a Hadsel Mixer.

Where The "Contract Record" Received Its Friends.

The Cement Products Company's Exhibit.

The Hadsell non-tilting concrete batch mixer which attracted the attention of these visitors was designed by a concrete engineering contractor of practical experience, and embodies practically every feature which is necessary for the successful operation of the concrete mixer, namely, simplicity, compactness and the rigidity which insures absolute alignment of all the driving mechanism. It would be impossible in a short space to mention the many important features of this mixer, and one may refer to a few of them. The drum is formed of eight cast iron segments forming an octagonal body, which

The B. Greening Wire Company's Exhibit.

are riveted together so as to avoid the use of bolts. Pressed steel buckets are attached to each drum segment and steel plate deflectors reach from bucket to bucket. The buckets carry the materials nearly to the top of the drum, the deflectors in the meantime imparting an additional movement of the aggregate from side to side. Upon the arrival of each bucket at the dumping point the materials are literally "cascaded" to the lower portion of the drum, this process being continued during each revolution. The mixer is equipped with a cast iron ferrule around the discharge opening which makes it impossible for the concrete to slop out of the discharge opening. There are many other advantages in connection with this mixer which will amply repay close inquiry by all who are interested in mixers.

Wettlaufer Brothers, Effective Exhibit

Wettlaufer Bros. were there with their mixers and brick machines, and were among the busiest men at the show. Messrs. William and John Wettlaufer were assisted by their father, Mr. Geo. Wettlaufer, who came from Buffalo for the occasion. They proved themselves to be a trio of hustlers and effected a large number of sales. Among the buyers of their machinery at the show were: A. Gardner & Co., 17 Yonge street Arcade, Toronto, power mixer; Geo. Chinery, Agincourt, Ont., power mixer; Thompson & Pearson, 176 Sheridan avenue, Toronto, power mixer; Ontario Concrete Paving Co., Toronto, power mixer; Thos. McAllister, Bolton, Ont., hand mixer; Thos. McMurray, 115 Northcote avenue, Toronto, power mixer; Crescent Concrete Paving Co., Toronto, power mixer; W. H. Patterson, Agincourt, brick machine; Leslie S. Odell, Odell P.O., power mixer; Jas. Harden, Colborne, power mixer; F. A. Phillips, Colborne, power mixer; J. Thompson, Beattie avenue, Toronto, brick machine; A. Morrison, 168 Lee avenue, Toronto, power mixer; Union Stock Yards, West Toronto, power mixer.

Included in the Wettlaufer exhibit were a 16-brick machine, a 6-brick power press, two No. 1 power mixers with automatic lift hoppers, a 2-wheel all-steel mixer for railroad construction, hand power mixers, block machines, silo machines, etc. The Wettlaufers have been selling machinery in Ontario for years and are well known all over the country.

WETTLAUFER BROS
STRATFORD &
MITCHELL ONT
AND BUFFALO N.Y.
MFGS. OF CONCRETE MACHINERY
CEMENT PRESSED BRICK
BLOCK-MACHINES
TILE-MACHINES
TORONTO
WINNIPEG
VANCOUVER
MIXER
ONE OF THESE MIXERS SOLD TO A GARDNER CO
THIS MIXER ONTARIO CONCRETE PAVING CO
CHINERY
STATES GYPSUM CO
CUSTOMERS USING WETTLAUFER BROS MIXERS
CUSTOMERS USING WETTLAUFER BROS. MIXERS
W H PATTERSON

Wettlaufer Brothers' Extensive Exhibit of Mixers and Brick Machines.

The "Contract Record" Booth

The columns which decorated the "Contract Record's" booth were of Canadian manufacture. Batts' Limited, who supplied these goods, are gaining a wide reputation as manufacturers of staved columns, their goods being in high favor with leading architects and contractors. The secret of this firm's success is due to the fact that its members are all practical men and know the business from the ground up. They have made a special study of the production of high-class columns, and have their factory so systematized that their goods are made at the lowest possible cost.

The B. Greening Wire Company

The B. Greening Wire Company, Limited, Hamilton, had a most attractive exhibit of wire and wire rope for building and contracting purposes. Their crimped steel wire for concrete reinforcing is made in any desired lengths, long lengths forming a continuous bond being a feature, as they are unquestionably the best for building floors or roofs of great length.

Greening's New Trussed Hard Steel Wire Lathing is a newer line now being placed on the market. Applying the principle of the truss to a wire cloth fabric this firm has succeeded in producing an article that has the maximum rigidity for a given weight of material employed in its construction. It presents strong resistance to the plasterers' trowel and plaster seizes it very quickly. This wire lathing can be delivered direct from the loom, lime coated, painted red, or regalvanized as the architect may specify.

The Greening exhibit also contained wire cloth for cement screening, 16 up to 35 mesh, and all widths up to 48 inches. They also showed heavy screening six feet wide, and they claim to be the only manufacturers in America making screens this width. There was also a display of wire rope for hoisting and derrick work, all kinds of perforated sheet steel, copper and brass for screening, and new styles of wire interlocked mats. Another very attractive feature of this exhibit was a handsomely framed sample showing Greening screens for every known purpose.

Mussens Limited Exhibit of Smith Mixers and Other Specialties

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Mussens Limited and the "Smith" Mixer

There was always an interested group around the exhibit of Mussens, Limited, where one of the Smith mixers was to be seen, along with several other specialties which Mussens, Limited, handle. The 1909 model Smith machine as shown in this exhibit is equipped with a side loading device, which was thoroughly tested and proved out by Mr. T. L. Smith, the inventor, in Milwaukee and other places in the United States before it was introduced to Canadian buyers. This year's model Smith mixer has no differences in appearance from the former style of machine except that it is made heavier and stronger and the drums on all sizes of Smith mixers are now being reinforced to take care of the heavy wear and tear which a mixer is obliged to stand. This reinforcement, when worn, can easily be replaced by the contractor himself, with the aid of an ordinary boiler maker, which is a great advantage as it will lengthen the life of the mixing drum to a great extent.

The mixer which was on exhibit was operated by an electric motor, which was greatly appreciated by those in charge of the exhibition as it prevented the making of dirt and smoke in the Arena. The Smith mixer is being supplied, as formerly, with any kind of power and made up in any form of equipment to suit the buyer.

Mussens, Limited, also exhibited a new machine in the Canadian market, called the Chicago mixer. This machine has several features of great advantage, one of which is the turbine loader, which enables the mixture to be loaded from a wheelbarrow almost on the ground level. This mixer is being put on the market by Mussens, Limited, to take care of small work where a cheaper machine than the Smith is required. It is claimed for the Chicago mixer that while it is a cheaper machine it is just as strongly and substantially built as its older brother, the well known Smith machine.

The Cement Tile Machinery Company, of Waterloo, Iowa, exhibited their tile machinery, etc. Mr. W. H. Stewart was in charge. This firm are making arrangements for a Canadian branch at Chatham, Ont., where, it is understood, they will be represented by Messrs. McKeogh & Trotter. The intention is that Mr. W. H. Stewart shall remain in Canada and take charge of their sales here. He will, no doubt, make a good Canadian.

London Concrete Machinery Company

"The Largest Exclusive Concrete Machinery Company in Canada." This is the slogan used by the London Concrete Machinery Company. Mr. Henry Pocock, the president and manager of this company, is a concrete machinery man from the ground up, and he has personally designed a number of their leading machines. The range of machinery shown by this company is immense, embracing almost every conceivable device used in the business. Mr. Pocock was personally in charge of their exhibit and was ably assisted by Mr. John C. Doidge, the secretary-treasurer of the company. All this company's machines are manufactured under their own patents, and that they have met with favor is shown by the rapid progress of the concern. They started in a very modest way, but last year erected a commodious factory. This, they thought, would fill their requirements for years to come, but already they have found it much too small, and important extensions are planned for this season. The company issued a very elaborate catalogue in which they explain that their aim in manufacturing is to produce labor-saving devices of the most modern character possible. With all their moulds for making concrete blocks and other forms of concrete they have endeavored to produce styles and designs which are works of art, at the same time keeping in mind the cost of production. In addition to giving close attention to the manufacturing and selling of their machinery the company make a specialty of giving their customers information in connection with concrete construction of all kinds. They maintain a drafting department and prepare detail drawings, estimates and specifications all without charge to their customers. In addition to samples of their many machines, an interesting feature of their exhibit was a concrete silo crib which is of great interest in farming communities. It will build any size of silo from five feet up, the most popular sizes being twelve to sixteen feet.

An Interesting Exhibit of Concrete Machinery made in Canada.

The United States Steel Products

The exhibit of the United States Steel Products Export Company was interesting. It was in charge of Mr. A. D. Level, of New York. A striking feature was a reinforced concrete sewer pipe with lock joints showing American Steel & Wire Company's reinforcement and special flat base. This company are pushing strongly triangular wire mesh for reinforcing concrete. One of the principal points of merit advanced on behalf of the mesh is that it does away with lapping and the consequent waste of metal. It requires no tieing, being supplied in long rolls up to six hundred feet. An interesting test of the mesh was made at the show, a five-inch slab of concrete, reinforced with the mesh, being subjected to a weight of 455 pounds per square feet. The slab was of an eight-foot span reinforced with 28 pounds of metal. It was said to show a deflection of 12-100ths of an inch under the weight mentioned. On Saturday afternoon a test was made of the carrying power of the slab, a report on which is being prepared.

F. H. Hopkins' Exhibit of Mixers, etc.

Messrs. F. H. Hopkins & Company, Montreal, exhibited the Ransome concrete mixers, $^{3}/_{4}$ cubic yard, $^{1}/_{4}$ cubic yard sizes, also their hand mixer, manufactured by the Ransome Concrete Machinery Company, of Dunellen, N.J. Two of the mixers exhibited demonstrated the standard outfits most commonly called for by contractors, both mixers being equipped with engines and boilers, one mixer having special charging hopper attached and the other fitted with the ordinary feed chute.

They also exhibited their latest design of concrete mixer, which was a machine arranged especially for street work. This machine was equipped with an automatic dumping skip car at one side, which, by the simple operation of a lever, loaded the hopper of the mixer with the unmixed materials. The materials were then fed from the hopper into the mixer drum and then discharged into barrows or carts. The machine was so equipped that skip cars could be operated from both sides or hoisting into buildings could be accomplished by the use of one of the hoisting drums.

F. H. Hopkins & Company's Exhibit of Ransome Mixers.

With this equipment the mixer was practically made a continuous machine, as three batches were being handled separately but all at the same time. This whole outfit was complete in itself and operated by a Fairbanks-Morse gasoline engine mounted on the same truck.

As this outfit was the first portable batch mixer designed for street requirements it attracted the attention of a great many visitors, who commented upon it very favorably. The Ransome hand mixer was very interesting to many contractors, as it seemed to fill the common requirement for a small hand mixer which could be easily operated by two men. This mixer was also demonstrated to be splendidly adapted for culvert and small concrete work.

Cement Product Company's Exhibit

An illustration of the Cement Product Company's exhibit is shown in this issue. This firm's business card states that they are manufacturers of artistic cement building materials, and their exhibit certainly bore out this contention. It was designed and erected under the superintendence of Mr. R. G. Rittenhouse, and attracted much favorable comment. Mr. Rittenhouse is a thoroughly practical man and, in addition to his other qualifications, is a competent architect. The manager of the company is Mr. A. F. Wells, the well known engineer, and under his direction its future is bright.

The Raymond Concrete Pile Company, Montreal, displayed their system of concrete piling suitable for large public buildings, harbors, bridges, or other structures requiring an especially strong foundation. They also showed pictures of their piling being put in place at the harbor sheds, Montreal; the legislative buildings, Regina, and the C.P.R. bridge at Lethbridge, which is one of the longest bridges on the Canadian Pacific Railway system.

Eadie-Douglas Company, Limited, Montreal, had an exhibit of the celebrated Terrano flooring, in charge of their Toronto representative, Mr. Macdonald.

The Thorn Cement Company's Exhibit

One of the strongest advocates of the wisdom of holding the Cement Exhibition and Convention was Mr. Alfred W. Thorn, president of the Thorn Cement Company, Toronto, who was indefatigable in his efforts to interest manufacturers and others to exhibit. This having been the first exhibition and convention of its kind in Canada, there were some who doubted the wisdom of holding it, but Mr. Thorn pointed out to them that by assisting the industry in general they would be instrumental in doing it a great deal of good, and to that extent, and possibly more, they would benefit themselves. This view prevailed with many, but there were some who did not see the force of the argument and in many instances they have already expressed their regret at not having been on hand with their exhibits. Mr. Thorn not only acted energetically in assisting the exhibition and convention, but by his own example did a great deal to assist them. The exhibit of his company illustrated the process of manufacture of cement, by showing the limestone and clay in the raw state, and in the different preparations up to the finished product. It also exhibited samples of work in which Lehigh Portland cement was used. One of the features of their exhibit was a window sill made of Lehigh Portland cement which was of particular interest, as it showed the beautiful white color which concrete shows when made of Lehigh Portland cement. This is a most important matter in cement and is frequently commented upon by users of the article.

The Thorn Cement Company's Exhibit of Raw Materials, Finished Product, etc.

The Montreal Rolling Mills Company exhibited their cold twisted steel bars for concrete reinforcement.

Goold, Shapley & Muir's Reversible Hoists, etc.

Goold, Shapley & Muir Company, Limited, Brantford, had several very interesting products in their exhibit. Among these was a reversible hoist of the portable type capable of carrying a load up to one thousand pounds. It is run by a 6 horse-power engine which requires only a small quantity of water for cooling purposes. Three pails of water will suffice for this machine, whereas other types require several barrels full. The machine being extremely portable can easily be removed at night, so that there is no need to be anxious about damage from frost. Another attractive machine shown by the company was a pumping machine for doing light work. This engine will pump water and is equipped for attaching other machines such as cream separators, pulpers, etc. It is run by 1½ horse-power. This company also showed an interesting mixer with features which rendered it different from any other at the exhibition. It is an automatic batch mixer. The front hopper holds two cubic feet. It has an automatic cement measurer by which the quantity of cement can be changed at will. Every time the hopper of the mixer goes up, it automatically liberates the proper amount of cement for the mixture. It is run by a 6 horse-power gasoline engine and is arranged so that it can be closed in at night. It is set upon very solid wheels, which make it extremely portable. Mr. John Muir, of Goold, Shapley & Muir, was present during part of the exhibition and took much interest in explaining the various points of interest in connection with this mixer.

U. S. Gypsum Company, Chicago, showed their hard wall plasters.

The Toronto Fire Brick Company's Exhibit

One of the notable exhibits was that of Mimico pressed brick and tile, manufactured at Mimico, Ont., by the Toronto Fire Brick Company, whose offices are at 611 and 612 Confederation Life Building, Toronto. This company was the only one to exhibit brick at the exhibition. Owing to the short time given for the preparation of the display no attempt was made to develop an elaborate design. Four walls were constructed in such a manner as to show brick set in different styles with different color of mortar, affording architects and others an opportunity to acquaint themselves with the combination most suitable for the work which they have in contemplation. The centre of the exhibit consisted of a plain mantel of a design suitable for hall, dining-room, library or den, made of klinker brick. This mantel brought forth many favorable comments.

Mimico brick is made of shale, the analysis of which is given herewith. It shows, the company claim, the largest percentage of oxide of iron contained in shale from which any pressed brick is made in Ontario, and they further assert that by a test which was made in November it was shown to be 35 per cent. stronger than that of the three principal pressed brick factories nearest Toronto. Mimico brick is made by the most modern machinery, burnt in down-draft kilns and made by experienced workmen. The company also make drain tile in sizes from 2½ to 12 inches.

The special characteristics claimed by the company, and admitted by those who have seen its brick, are strength, depth of color and the entire absence of "skin" to reflect the sunlight, which is a failing of many classes of pressed brick.

Contractors report that this brick is easy to work and true to form and size. Architects frequently state that since the advent of Mimico pressed brick there is no justification for importing red pressed brick from the other side. The company make a practice, when in doubt, of grading the brick in favor of the customer, and their motto is: "We ship when we say." Their exhibit at the Cement show was rendered doubly effective by the clever display of a sign which read as follows: "Fads may come and fads may go, but brick goes on forever."

The analysis of the company's red pressed brick, as shown by the Government's report, is as follows: Silica, 57.12 per cent.; alumina, 16.49 per cent.; ferric oxide, 7.28 per cent.; lime, 3.92 per cent.; magnesia, 3.32 per cent.; soda, .40 per cent.; potash, 3.06, per cent.; sulphe trioxide, 0.00 per cent.; loss by heat, 6.40 per cent.

Mimico Red Pressed Brick Shown by Toronto Fire Brick Company.

The National Portland Cement Company, of Durham, had a prominent location and made good use of it.

W. D. Beath & Son's Display

W. D. Beath & Son, 193-195 Teraulay street, Toronto, who are large dealers in contractors' supplies, had an attractive exhibit in the form of a miniature building showing fireproof construction as applied to the building of houses, factories, hotels and fireproofing in general. In this exhibit the Prong system of attaching metal lath to studding was shown. The use of steel studding, metal lath and concrete plaster in this structure vividly illustrated a concrete reinforcement system which is theoretically and practically correct. This firm carries in Toronto a large stock of builders' and contractors' supplies, including a full line of the Galt Art Metal Company's goods, expanded metal, triangular mesh wire, Ferro Lithic plate, round, square and twisted bars, superior Portland cement and Hamilton red pressed brick. They are also patentees and sole manufacturers of Beath's overhead carrying system, for handling cement, concrete, stone, gravel, etc. This system is also largely used in wholesale warehouses, breweries, and other places requiring to store or convey large packages or barrels.

W. D. Beath & Son's Sheet Metal Lumber, etc.

The Perfect Mould Company, of Kendallville, Indiana, were among the United States exhibitors. They are manufacturers of concrete fence post moulds, brick moulds, adjustable sill moulds, circular moulds.

Canada Wire Goods Company's Exhibit

The Canada Wire Goods Manufacturing Company, of Hamilton, had one of the most complete exhibits to be seen of their class of materials. It included reinforcement for concrete work, sand screens, coal screens, jail cells, wire cloth for cement factories, wire mats, sanitary clothes lockers, wire brushes, sieves and foundry supplies. In the continuous reinforcement which this company produces the metal used is of the highest class. The wire is specially hard drawn, showing a very small percentage of elongation within the elastic limit. This, they claim, produces not only more rigid work, but also floors, beams or girders which will show less defection under a given load than any other. For the erection of roofs, they claim that this class of reinforcement has no superior. As it knits the entire roof into an actual monolithic slab, weak at no point and so tied together that in case of accident to the roof no single section will fail. One of this company's most attractive products is the Holmes Portable Wire Filing Case.

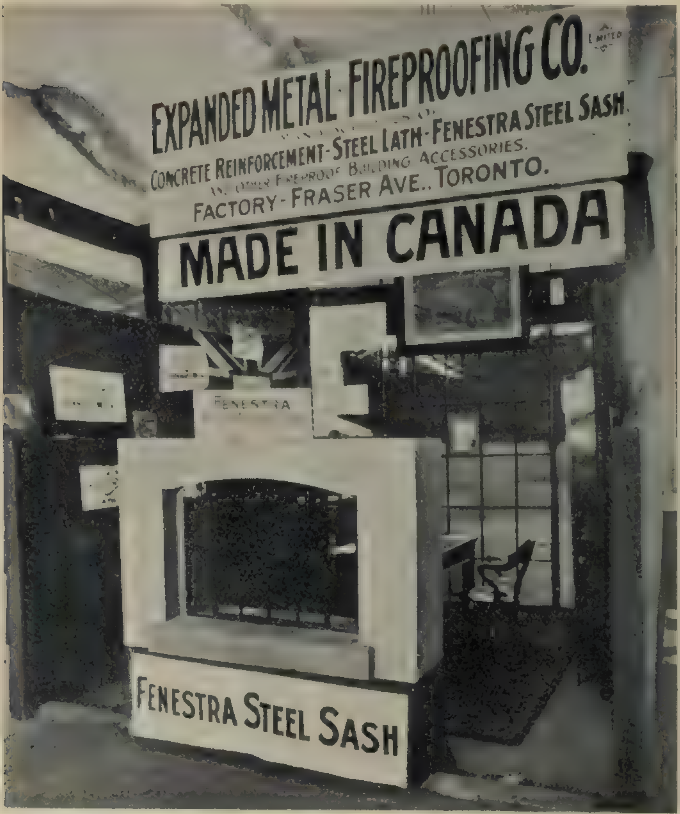
The jail cells manufactured by this company are of the most modern and practical type. The company claim that the merits of their jail cells are so well recognized that they practically supply the Dominion. The locking devices of these cells are unusually effective. In addition to a Yale jail padlock, the door is provided with an automatic jump locking device which serves it at the top, bottom and centre by simply closing it, and the lock is protected in such a manner that the prisoner cannot tamper with it. The company are now fitting out the jail at Fernie, B.C., with cells, gratings, etc. When the work is completed the Fernie jail will have, it is claimed, the most complete set of jail cells, doors, gratings, etc., ever erected.

Extensive Display of Canada Wire Goods Products.

Another of this company's products which is in much demand is its "XL" wire lathing, which is japanned or galvanized after weaving. In this lath the metal is disposed in accordance with scientific principles in such a way that, they claim, expansion and contraction due to fire cannot break the key of the mortar. The Canada Wire Goods Manufacturing Company was established in 1891. The members of the firm are Messrs. Wm. Holmes and Alexander Donald, both of whom are practical men in their business.

Expanded Metal Company's Products

The Expanded Metal & Fireproofing Company, Toronto, had a number of their products on exhibition which attracted much attention. Among these were the following: Concrete reinforcement, steel lath, "Fenestra" steel sash," and other fireproof building accessories. At the front of their exhibit they had an example of the "Fenestra" steel basement sash, which combines frame, sash and guard in one piece. They also exhibited an interesting example of their expanded metal lockers. Expanded metal is a web of high grade steel which is cut and expanded at one operation to the required size of mesh. There are no joints or connections as each sheet is a single piece of metal. For this reason lockers made of expanded metal cannot be entered improperly except by the total destruction of a panel. The expanded metal lattice which was on exhibition affords a splendid screen for windows, verandahs, railings, etc. It would take much space to do justice to the steel sash which this company exhibited. It has become standardized in Great Britain and continental countries, and should commend itself to those who are building in Canada, as it combines a handsome light appearance with great rigidity and strength, and can be built into any style of building. It compares favorably with wooden sash in price and has numerous other qualities of great value.


EXPANDED METAL·FIREPROOFING CO. LIMITED
CONCRETE REINFORCEMENT-STEEL LATH-FENESTRA STEEL SASH
FIREPROOF BUILDING ACCESSORIES.
FACTORY-FRASER AVE., TORONTO.
MADE IN CANADA
FENESTRA
FENESTRA STEEL SASH

Expanded Metal Company's Exhibit.

The Roman Stone Company's Attractive Exhibit

The Roman Stone Company had an exhibit which was much admired by the visitors. It consisted of a small bank front which showed off the company's stone to splendid advantage as this is a class of work for which it is particularly well adapted. In addition they showed some very fine carving, which included two lions, and a coat of arms for the bank of Montreal. This coat of arms has been supplied to five of the branches of that institution. Perhaps the most interesting feature of the exhibit was a couple of pilaster capitals of Roman stone which were being carved by hand so as to illustrate the fact that Roman stone can be carved after it has been made, just as successfully as any other class of stone.

Pilkington's British Made Glass

A unique and artistic display of British made building, memorial, ornamental, and horticultural glass was made by Pilkington Bros., Limited, proprietors of the St. Helens Glass Company, St. Helens, Lancashire, England. This firm has a world-wide trade, and is especially equipped for Canadian business, having offices and depots in Toronto, Montreal, Winnipeg and Vancouver.

The well known principles of the prism are amply illustrated in Pilkington's Patent Prismatic Rolled Glass. The glass is manufactured in three different angles, to be used according to the position of the windows to be filled, so that every ray of light available is directed horizontally, securing the even and natural illumination of the whole room. In some cases, such as in shops where the windows are boxed off for display purposes, this Patent Prismatic Glass is of special value, as it can be applied to the upper parts of the window so as to thoroughly light the shop behind the enclosed show space. In banks or other places where window screens are necessary this glass is also of great value, as, being translucent, but not transparent, it secures privacy without diminishing the light.

Pilkington Brothers, Display of Glass.

Pilkington's Patent Wire Rolled Glass has been before the public for a number of years and has the distinct advantages of being fireproof, stone proof and burglar proof. It is regularly specified by architects and engineers for use in roofs of exposed buildings, central electric stations and warehouses. In case of fire this glass does not break, but holds together although it may become red hot. Other kinds of glass, where the wire is not embedded, crack and fall to pieces when in contact with very little heat. Wire rolled glass also does away with the use of shutters in a building, as it is most difficult to be broken. Public tests made in London, England, and other places have established the supremacy of this glass for fireproof buildings.

The Canada Foundry Company have purchased the Canadian rights of the Koehring mixer and had this line on hand for the edification of contractors. Mr. H. O. Edwards, the company's well known advertising manager, was in charge.

Exhibit of the Canada Metal Company

Visitors to the exhibition were impressed wherever they went with metals, the Canada Metal Company, Limited, of Toronto, having a fine exhibit of babbitt metals. Metal hats, distributed freely by the Canada Metal Company, were worn by many visitors and exhibitors. The general manager, Mr. W. G. Harris, was busy explaining the different goods manufactured by the company. The company are doing an extensive business with cement manufacturers, on brass castings, babbitt metals, and white waste. Their metals have been favored by the different manufacturers because of the excellent services they give. The Harris heavy pressure bearing metal, made for all-round machine bearings, crushers, etc., is especially popular. The Canada Metal Company, Limited, have their own chemical laboratory, where they test all raw material entering into their lines, thereby assuring uniform mixture at all times.

THE CANADA METAL CO. LIMITED.
WILLIAM ST. TORONTO.
Everything in Metals.
OUR SPECIALITIES.
BABBITT METAL. SOLDER. LEAD PIPE. PURE BLOCK TIN PIPE. LEAD TRAPS. AND BENDS.
FUSE WIRE. BATTERY ZINCS. INGOT COPPER.
Lead. Tin. Spelter. Antimony. Aluminum And All Ingot Metals.
THREE SPECIALS
BABBITT METALS
METALS
CANADA METAL

Canada Metal Company's Display of Products.

The Ideal Concrete Machinery Company, London, Ont., had a most artistic and attractive exhibit, showing architectural porch and column work, also an interior design in the shape of an inside wall with a mantel display made out of white-faced cement brick. Their display of lawn vases also attracted much attention. In addition to the regular style of concrete block work they had also tycrete blocks showing marble and granite-faced effects which were scarcely distinguishable from real marble or granite. The exhibit was in charge of C. F. Pulfer, the Canadian manager, assisted by J. Augustine Smith, secretary of the home office at South Bend, Indiana, and Fred M. Leach, of Detroit, sales manager for the State of Michigan. This firm also showed a "Peerless" cement brick machine for which they have secured the Canadian patents.

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Cornices, Skylights, Ventilators, Finials.
Corrugated Iron, straight or curved.
Metallic Shingles, Siding, Ceiling and Lath.
Fire-proof Windows, Shutters and Doors.
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Reliable goods only. No cheap trash.

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We make and have made Steel Tanks for almost every mechanical purpose, as for instance

Water Tanks, or Towers
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It is not feasible to enumerate all the many styles of Tanks we make. Suffice to say that we are open to make Steel Tanks Every SIZE or SHAPE you want them, and either plain or jacketed.

Get our Prices - They are Right
All Workmanship Guaranteed

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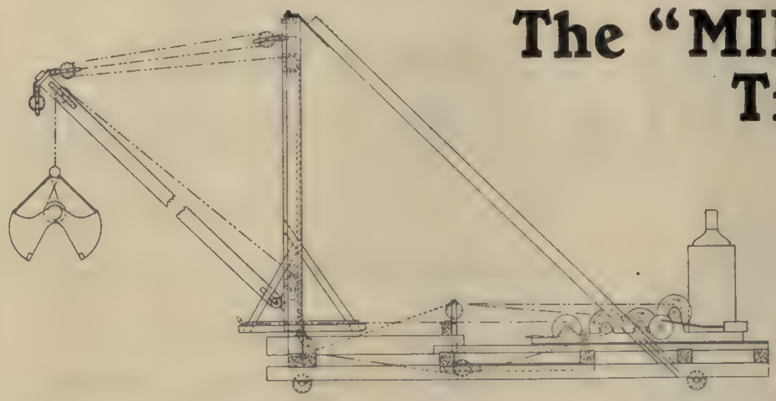

The "MIDLAND"
Travelling Derrick

made with or without Self Propelling Gear.
Adjustable Stiff Legs for uneven ground furnished if desired.
Derrick Irons, Bronze Bushed Sheares all sizes, Hand Winches, double and single purchase.

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The Round Copper Covered Cake.

Harris Heavy Pressure Bearing Metal
HAS NO EQUAL

It positively reduces Friction to a minimum. Will not Shrink, Crack, or Beat Out of Bearing.

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Bill Stuff
In Long and Large Sizes
Interior Woodwork of Superior Quality for High-Class Buildings
Established 1851

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You can effect a saving of 50% by the use of our

Little Giant Pneumatic Drills and New Boyer Riveting and Chipping Hammers

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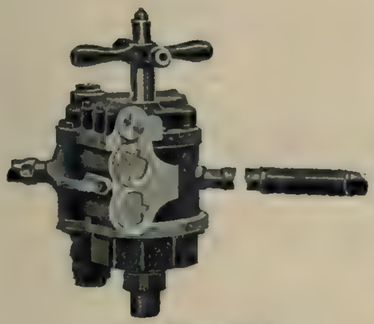

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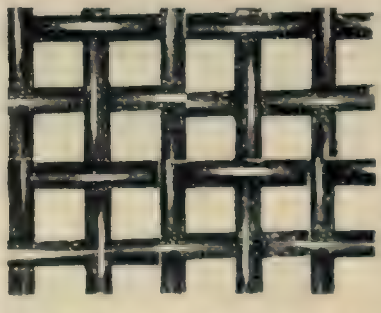

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enhances the beauty of a building by giving to its interior that finished effect impossible to obtain from cheaper flooring.

In its manufacture, skill, experience and modern machinery have combined to produce perfection. Carefully selected and scientifically treated hardwoods are used.

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Passenger **Freight**
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HAND POWER HOISTS

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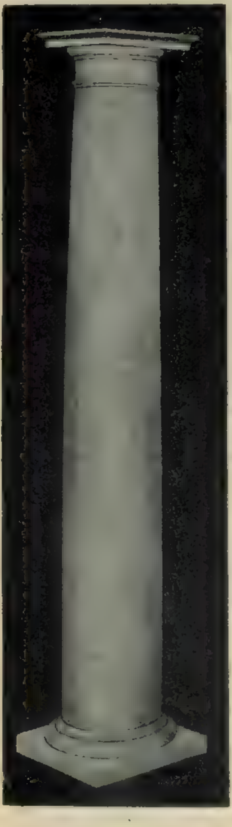

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Expanded Metal, Triangular Mesh Wire, Ferro Lithic Plate, Round, Square and Twisted Bars.

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Rich Color, Good Quality.

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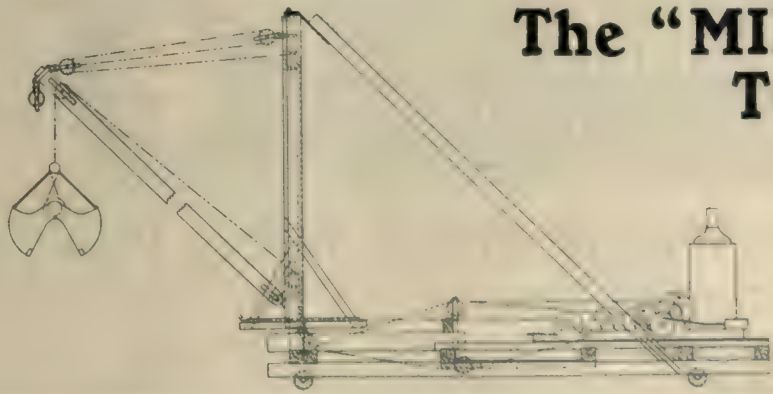
We handle all classes of work from the largest contracts to the smallest requirements of the marble and Tile trade. Write us for prices.



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made with or without Self Propelling Gear.
Adjustable Stiff Legs for uneven ground furnished if desired.
Derrick Irons, Bronze Bushed Sheares all sizes, Hand Winches, double and single purchase.

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The "L & K" Test Boring and Light Well Sinking Machine

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It is furnished with bronze stem, disc rings and seat rings, is of substantial design and weight and is tested thoroughly before shipment is made.

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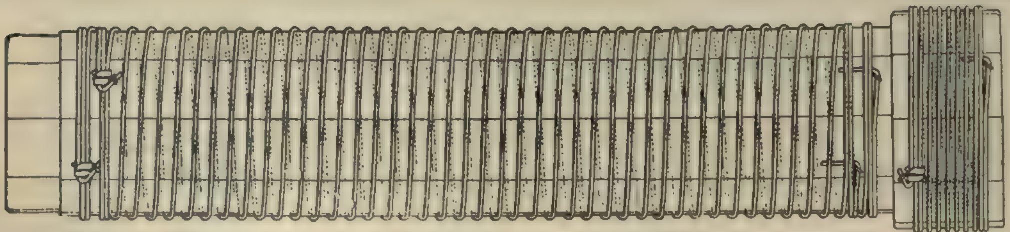

End View of Pipe and Coupling.

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Showing special method of winding with two independent parallel wires. The great advantage of this is that in event of one wire becoming damaged the pipe stil' retains a factor of safety of 2. 5. Made only by

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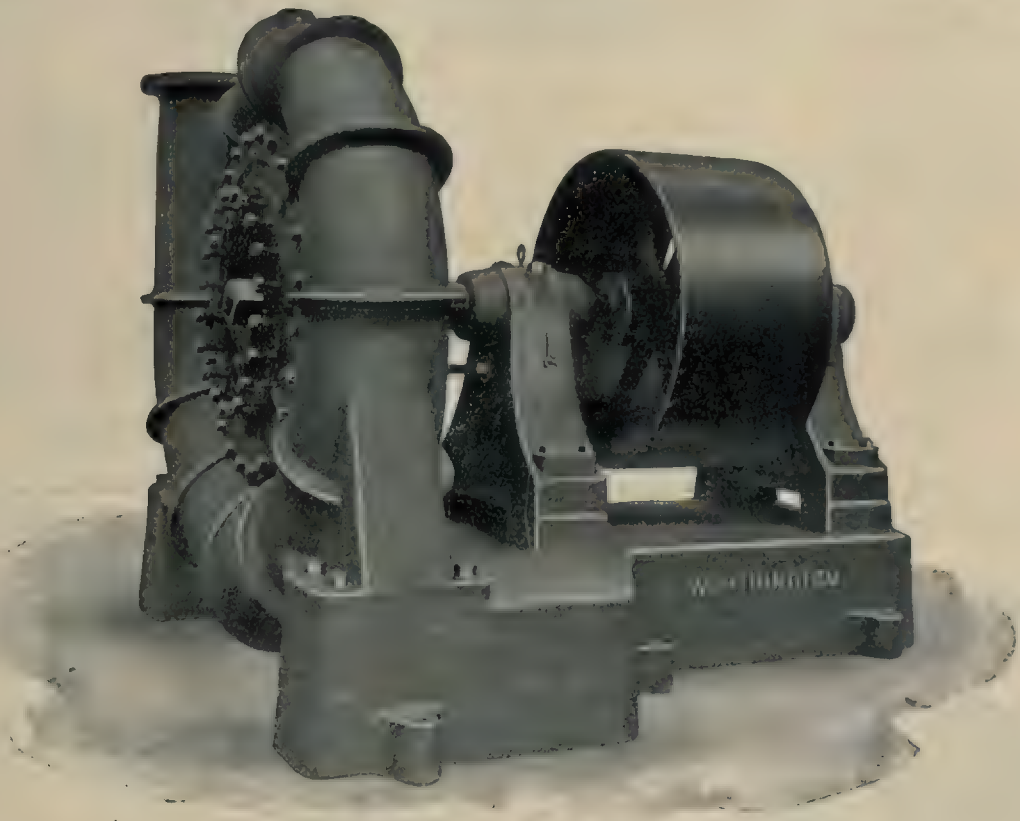

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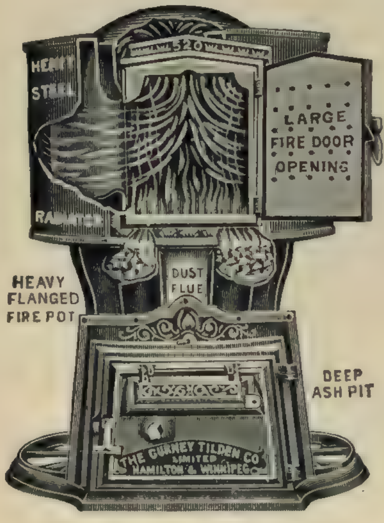

The New Idea Warm Air Furnace

The ash pit or base section of the New Idea is unusually heavy and substantial. It is of good depth, permitting easy removal of ashes, and allowing a proper supply of air for the fire and grates.

The general dimensions and radiator construction of the New Idea are such as to result in a low down furnace, that is, the total height is as low as possible, thus permitting lots of "slant" or elevation to the warm air pipes, giving a rapid circulation of air. The more slant or elevation the warm air pipes have, the better your furnace will work.

——Direct Draft Damper——

There is a Direct Draft Damper on the New Idea, giving a short direct route to the chimney so as to enable you to quickly kindle a fire. Simply pull the damper knob at the left hand top corner of the fire door—this opens the damper and gives direct draft, Users of soft coal will appreciate this feature.

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Berlin, Ont.
The Board of Works will receive tenders up to March 31st for constructing cement walks during the year 1909. (See Advertisement.)

Fort Erie, Ont.
The ratepayers have defeated a by-law for the establishment of a municipal waterworks system.

Guelph, Ont.
The plans for the sewage system in this city were approved last week by the Provincial Board of Health.

Hamilton, Ont.
At a recent meeting of the Board of Works a sub-committee was appointed to report to the council on the purchase of a stone crusher to cost about $2,000.

Kamloops, B.C.
The Streets Committee will expend $6,000 upon local improvements this summer.

Montreal, Que.
The Roads Committee last week opened tenders for pavements, flagstones and other supplies required by the department for the current year. 150 tenders were submitted.

Toronto, Ont.
The City Engineer has withdrawn his recommendation for the construction of a sewer on Ulster street from Brunswick avenue to Borden street.

City Engineer Rust states that work will be commenced on section 3 of the trunk sewer as soon as the controllers and the council approve the experts' report and award the contract. Section 3, where the work will begin, runs from Jarvis street to the Don.

The following pavements have been recommended by the City Engineer: Asphalt—Caer Howell, from Simcoe to University avenue, $1,093, Caer Howell, from McCaul to Simcoe, $4,560; asphalt block—Temperance street, from Yonge to Bay street, $13,188; bitulithic — Sunnyside avenue, from Wright avenue to Howard Park avenue, $21,269, Rowanwood avenue, from 429 feet east of Yonge street to Scarth road, $11,409; brick—Marien street, from Roncesvalles avenue to Sunnyside avenue, $2,865.

Vancouver, B.C.
The City Council have decided to use fir and cedar blocks for most of their street paving, and have adopted the policy of having them creosoted with a proper plant which forces the treatment through and through the wood. It is also claimed that the life of treated fir is ten years, and a guarantee of eight years goes with the work.

Victoria, B.C.
The City Council recently decided to send a special committee to Portland to investigate various kinds of pavements.

On the report of this committee will depend to a great extent what style of pavement will be adopted here in future. There is a large amount of paving work projected, in a considerable portion of which it was intended to use wood blocks, but if a more suitable material can be secured it is probable that it will be adopted.

Winnipeg, Man.
At a recent meeting of the Board of Control, Alderman McLean asked that the asphalting of Selkirk avenue, from Main street to Andrews, be proceeded with this spring. The whole question of asphalting will be taken up at an early date. W. F. Tallman reported on the street roller tenders. A gasoline roller was favored.

AWARDED.

Brantford, Ont.
The Board of Works have recommended the acceptance of the following tenders for supplies for 1909: Paving brick, Louis H. Gipp, Buffalo, "Bessemer Block;" lumber, contract divided between Mickle, Dyment & Son, and Schultz Bros. Company, Limited; special castings, Hartley Foundry Company; sewer pipe, T. A. Cowan.

Railroads, Bridges and Wharves

Ottawa, Ont.
The residents of Ottawa South will present a petition for the construction of a new bridge at Bank street.

A deputation from the City Council waited upon the Hon. G. P. Graham, Minister of Railways and Canals, last week to ask for an appropriation for a bridge over the canal at Mutchmor street. The matter is in abeyance.

Application will be made at the present session of parliament for the incorporation of the Lake Superior and Long Lake Railway and Transportation Company. Mr. R. A. Pringle, M.P., Cornwall, Ont., is solicitor for the applicants.

Tenders addressed to L. K. Jones, Secretary, Department of Railways and Canals, will be received until March 29th for a concrete superstructure for a press on the Galops canal. A deposit of $4,000 is required. Plans at the office of C. D. Sargent, District Engineer, Cornwall, Ont., and at the Department.

The Railway Commission heard argument last week in the application of the city for an order compelling the G. T. R. to widen and raise the bridge over Preston street. In the course of the proceedings Assistant Engineer Parsons told the Board that it would cost $16,188 to replace the bridge with a proper structure and alter the grade. The Chairman reserved judgment.

Peterborough, Ont.
The C. P. R. will double track their line between Smith's Falls and this city, a distance of 133 miles, and carry out the construction of the direct grain route, about 76 miles in length.

St. Andrews, N.B.
It is stated that the C. P. R. will build a new wharf at an estimated cost of $20,000.

St. Boniface, Man.
Tenders addressed to P. E. Ryan, Secretary, Transcontinental Railway Commission, will be received until April 8th for the construction and erection of a steel and concrete bridge and approach spans over the Red river, between this city and Winnipeg. Separate tenders for sub-structure and superstructure. Plans and specifications may be obtained at the office of S. R. Poulin, district engineer, St. Boniface, Man., and at the office of H. D. Lumsden, chief engineer, Ottawa, Ont.

St. Catharines, Ont.
Tenders addressed to L. K. Jones, Secretary, Department of Railways and Canals, Ottawa, Ont., will be received until March 23rd for stone protection on summit level, Welland Canal. Specifications may be seen at the office of the superintending engineer, Welland Canal, this city, and at the Department.

St. Thomas, Ont.
The Elgin County Council have ordered the construction of a breakwater near the Port Stanley road. Engineer Bell's estimate of the work is $4,200.

Vancouver, B.C.
Coleman & Evans are commencing the construction of an addition to their wharves, estimated cost, $10,000.

Winnipeg, Man.
The following C. P. R. improvements will be carried out on the Western Division this year: New line from Weyburn running west about 50 miles. This will eventually be extended to Lethbridge and form a second main line for traffic between Crow's Nest Pass and Winnipeg. Ballasting on the Weyburn-Stoughton line and the branch to Outlook. New terminal yards at Moose Jaw. Completion of grade division work between Medicine Hat and Swift current. Ballasting between Lethbridge and Coleridge. New line north from Cheadle, Alta.

AWARDED.

Gananoque, Ont.
The Roads and Bridges Committee have accepted the tender of Taylor & Green for 200 pieces 3x12x18 red pine for bridge purposes, at $25.35 per thousand board measure, f.o.b.

Vancouver, B.C.
Waddell & Harrington, of Kansas City, Mo., have just secured the contract for undertaking all the engineering work of the Alberta & Great Waterways Railway, extending from Edmonton to Fort McMurray at the head of navigation on the lower reaches of the Athabasca river. With branch lines it will have a length of about 350 miles. It is their intention to place survey parties in the field within a month or two and this season will see construction work well advanced from the Edmonton end. The entire line will be com-

pleted and in operation within three years or 12 months ahead of the time limit for its construction. Mr. Waddell states that in bridgework alone his firm is now carrying out works involving an expenditure of $3,500,000.

Public Buildings, Churches, Schools, etc.

Brandon, Man.
An addition of 50 feet is to be added to the C. P. R. station this season.

Brantford, Ont.
The Building and Grounds Committee of the County Council recommend an appropriation of $5,000 for interior improvements at the court house. Plans for the work have been submitted by L. Taylor, architect.

Taylor & Taylor, architects, this city, are preparing plans for the following buildings: Colborne Street Methodist Church, Brantford; King Street Methodist Church, Ingersoll; school building for S. S. No. 18, Brant County, also for repairs and additions to the County Buildings, Brantford.

Charlottetown, P.E.I.
Tenders for fittings for the post office at this place will be received until March 22nd by N. Tessier, Secretary, Department of Public Works, Ottawa. Plans and specifications at local post office or at the Department.

Chipman, Alta.
A modern school building may be erected here at a cost of $15,000.

Calgary, Alta.
Tenders will be received until April 15th for the erection of a public library in this city. (See advertisement.)

Dresden, Ont.
Preliminary sketches are being prepared for a new school building.

Fernie, B.C.
Tenders close March 22nd for the erectoin of the proposed new court house. Plans and specifications may be seen at the office of the Public Works Engineer at Victoria, B.C., or at the office of the Government Agent in this city. G. Stanley Rees, Fernie, B.C., architect.

Fort William, Ont.
The Oliver Agricultural Society are contemplating the erection of a building this year.

Fort Rouge, Man.
Tenders addressed to R. H. Smith, Secretary Treasurer, Winnipeg Public School Board, will be received until March 19th for the erection of a stone and brick school at Jessie and Lilac streets. Plans and specifications may be seen on application to J. B. Mitchell, Commissioner of School Buildings.

Hamilton, Ont.
Herbert H. New, architect, 608 Spectator Building, is preparing plans for the new Herkimer Baptist Church. Construction—brick and cut stone, slate roof, steam heating, electric lighting. Estimated cost $22,000.

Ingersoll, Ont.
Tenders will be received until March 27 for the erection of a four roomed school building at this place. Taylor & Taylor, architects, Brantford, Ont. (See Advertisement.)

Kamloops, B.C.
The K. M. & A. A. hall will be improved and enlarged this year.

London, Ont.
Plans for enlarging the smallpox hospital in this city at a cost of $3,000, were submitted to the Board of Health last week by City Architect Nutter. The amount will be included in the estimates which come before the Council at their next meeting.

Mount Forest, Ont.
A site has been selected for the proposed new post office.

New Westminster, B.C.
Queens Avenue Methodist Church will erect a new parsonage.

Ottawa, Ont.
W. Rae, Secretary Treasurer, Public School Board, will receive tenders until March 23rd for fourteen fire extinguishers, also for wire screens for the Cambridge and Elgin street schools. Specifications at office of W. B. Garvock, Superintendent of Buildings, Creighton street school.

It is proposed to erect a new Anglican church in the Ninth ward this season.

The Methodist Social Union have selected a site in Ottawa East for a new church.

Prince Rupert, Man.
At a meeting of the Hospital Association of the Methodist church a committee was appointed to secure a site and plans for a new hospital.

Paris, Ont.
The architectural buildings at the Fair grounds, owned by the North Brant Agricultural Association, were destroyed by fire last week.

Peterborough, Ont.
The officials of the House of Providence are considering the erection of a new building for the Catholic poor of this city. If assistance can be obtained from the City Council, a new building may be erected at a cost of from $30,000 to $35,000.

South End, Ont.
Tenders addressed to A. J. Potter will be received until March 18th for the erection of a brick school building for school section No. 4 in the Township of Stamford. Plans may be seen at the office of C. M. Borter, architect, Niagara Falls, Ont.

St. John, N.B.
Neil Brodie, architect, this city, has been instructed to prepare plans for a new R. C. brick school building for Bishop Casey. It is expected that the structure, which will accomodate four schools, will be completed this season.

St. Marys, Ont.
The St. Marys Boat Club have organized a joint stock company for the purpose of erecting a club and boathouse. The provisional directors include Dr. Follick, R. Hunter and R. T. Matthew.

Saskatoon, Sask.
A union station may be erected here by the C. N. R.

Sydney, C.B.
The city hall here will be remodelled. A new firehall will also be erected.

Souris, Man.
The hospital board have purchased a new site in the northeast part of the town and will proceed with the erection of a new building as soon as the weather will permit.

Thessalon, Ont.
Plans for a new school building, to cost $12,000, were recently approved at a meeting of the public school board and town council.

Toronto, Ont.
Tenders close March 22nd with Darling & Pearson, architects, 2 Leader Lane, for all trades required in the erection of a building at the corner of Bloor and Spadina avenue for Toronto University.

A new building is to be erected by St. Paul's Church at an estimated cost of $150,000. The preliminary suggestions are for a building 85 x 175 feet, to be constructed of broken ashler stone and to have a capacity of 2,500. E. J. Lennox, architect, has plans in hand and will submit a sketch of the proposed new building at the vestry meeting to be held on March 23rd.

Vancouver, B.C.
Plans are being prepared for the erection of a new Anglican church at West Burnaby.

Ville Emard, Que.
Tenders will be received until March 16th for the construction of a school on Sixth avenue. A. M. Ligouin, architect, 240 Ontario street, Montreal. M. Jodoin, secretary-treasurer of School Commissioners of Ville Emard.

Victoria, B.C.
It is expected that the contract for the erection of the Chambers street school house, estimated to cost $70,000, will be let this month.

The Y. M. C. A. are thinking of putting up a new institute.

The School Trustees recently opened tenders for the new Chambers street school. Tenders reecived were for a flat roof and a pitched roof building. For a flat roof building, exclusive of heating and ventilating, it was found by the lowest tenders that the cost would be $63,583, while a pitched roof building would cost $64,603. The committee recommended in its report that the Kahn system of reinforced concrete be used. This system will reduce the amount by $2,926. The report recommended that fresh tenders be called for painting and glazing, as a reduction in cost has been provided for the specifications. The report was adopted. The lowest tenders were as follows: Brick and stone work, Parfitt Bros., for flat roof, $42,837, for pitched roof, $41,487; carpentry, W. A. Gleason, for flat roof, $7,659, for pitched roof, $8,698; galvanized iron work, Pacific Sheet Metal Works, for flat roof, $1,865, for pitched roof, $2,746; plumbing, J. Colbert, for flat roof, $4,487, for pitched roof, $4,487; wiring, Hawkins & Hayward, for flat roof, $1,365, for pitched roof, $1 356; plastering, J. Allen, for flat roof, $2,506, for pitched roof, $2,506; painting, Arman Lewis, for flat roof, $3,323, for pitched roof $3,323. Total for flat roof, $63,583, for pitched roof, $64,603.

Winnipeg, Man.
The Town Council is negotiating for a Carnegie library.

Plans for the proposed new school building are being considered.

A. and W. Melville have been appointed architects for the new firehall to be erected in Weston.

The Hebrew Association, Limited, have obtained a permit for the erection of a theatre on Selkirk avenue. Estimated cost $3,200.

The public school board is advertising for tenders for the school to be erected on the La Verandyre site at the corner of Jessie and Lilac streets, in Fort Rouge. The building will be of brick, stone and concrete construction, two storeys and basement, and will have 21 rooms, including gymnasium and kindergarten. The building will cost about $60,000.

The Knowles Home for Boys may erect a new building this season. The matter is now in the hands of the Ways and Means Committee.

The Presbyterian building committee will secure plans for a new church at the corner of Merbey and School streets.

The Central Congregational Church are considering the extension of their building.

It is stated that the estimated cost of the proposed addition to the Home for the Aged at Middlechurch is $27,000. Plans are now being prepared.

Woodstock, Ont.
The Salvation Army are thinking of putting up a new building at a cost of $5,000.

AWARDED.

Brantford, Ont.
Taylor & Taylor, architects, this city, have awarded to Glanfield & Ripley, Jarvis, Ont., at $8,000, the contract for the Ville Nova Baptist Church.

Kingston, Ont.
Tenders for the erection of the new observatory for Queens University have been awarded as follows: Masonry, H. W. Watts; carpentry, Hunter & Harold; plumbing and tinsmithing, McKelvey & Birch; painting, W. J. Savage. Architects, Power & Son.

Wainwright, Sask.
The contract has been awarded for the erection of an Immigration hall to cost $35,000.

Residences

Kincardine, Ont.
Tenders addressed to J. D. Miller will be received until April 1st for the erection of a red pressed brick residence. Plans and specifications may be seen on application at Mr. Miller's store.

Moncton, N.B.
William Stone will shortly erect three houses on the upper end of Cornhill street.

Collingwood Clark will erect a two storey residence on Austin street. W. G. Jones will build twelve new buildings on the Mount View Estate.

Montreal, Que.
Jos. Sawyer, architect, this city, has prepared plans for a three storey building to contain stores and dwellings, to be erected at the corner of St. Catherine and Dufresne streets, for Mr. F. Harel. Estimated cost, $55,000.

Wright & Son, architects, this city, have completed plans for a three storey apartment house to be erected on Crescent street, at a cost of $35,000.

A three storey apartment building will be erected on Mountain street for Mr. J. D. Duncan, 218 Mountain street. MacVicar & Heriot, 104 Union avenue, are the architects.

Brown & Son, architects, this city, have prepared plans for a $25,000 apartment house to be built on Major street.

Outremont, Que.
J. E. Huot, architect, Montreal, has prepared plans for two two storey residences, to be erected in St. Catherine road, for C. P. Beaubien and E. G. Beaubien, of Montreal.

St. Zotique, Que.
J. E. Huot, architect, Montreal, has completed plans for a country residence to be erected at St. Zotique for Mr. N. Corbeau.

Saskatoon, Sask.
R. N. Baldwin will erect a three storey tenement block on Second avenue, near the Empire hotel.

Toronto, Ont.
Tenders will be received until March 20th by Symons & Rae, architects, 15 Toronto street, for all trades required in the completion of an apartment house, to be known as Devonshire Court, Madison avenue.

Recent building permits include: E. P. Atkinson, two two storey brick dwellings, Walter street, $6,000; Waters & Elliott, pair two storey semi-detached brick dwellings, Vermont avenue, $4,000; Waters & Elliott, three attached two storey brick dwellings, Vermont avenue, $5,700; Thos. McIllwain, three storey brick apartments, King street, $16,000; H. E. Bell, pair semi-detached two storey brick dwellings, Fairview avenue, $4,000; J. Crang, two detached two and a half storey brick dwellings, Dovercourt road, $5,000; Chas. A. Grant, three attached two storey brick stores and dwellings, Queen street east, $7,000; W. S. Appleton, pair semi-detached two storey roughcast dwellings, brick fronts, Victor avenue, $4,000; John Waghorn, pair semi-detached two storey brick dwellings, Howard Park avenue, $4,000; W. S. Simpson, pair semi-detached two storey brick dwellings, Delaware avenue, $3,800; J. B. Cunningham, two detached two storey brick dwellings, Margueretta street, $5,000; R. D. Hall, pair semi-detached two storey and attic brick dwellings, Cowan avenue, $5,000; R. Robson, pair semi-detached two storey brick dwellings, Margueretta street, $5,000; J. D. Wilson, pair semi-detached two and a half storey brick dwellings, St. Clarens avenue, $6,000; M. McLaughlin, two storey brick dwellings, Dunvegan avenue, $10,000; R. P. Allen, two storey brick dwelling, Balsam avenue, $3,200; Davis and Moore, pair semi-detached two storey brick dwellings, Margueretta street, $4,000; A. Brigden, three pairs semi-detached two storey roughcast dwellings, brick fronts, Bain avenue, $8,000; J. J. Palmer, two and a half storey brick dwelling, Heath street, $10,000; Sir Wm. Meredith, two storey and attic brick dwelling, Binscarth avenue, $6,000.

Vancouver, B.C.
Parr & Fee, architects, this city, have prepared plans for a three storey and basement structure to be known as the Banfield Building, to be built at the corner of Bute and Melville streets. Estimated cost, $20,000.

Westmount, Que.
Saxe & Archibald, Montreal, have prepared plans for a residence for Mr. Fraser.

Welland, Ont.
The Page-Hersey Company, Limited, will erect a number of workingmen's houses this spring.

Winnipeg, Man.
Samuel Harkel has been granted a permit for the erection of a two storey residence on Alverstone avenue.

Recent permits issued for residences include: Alex. Klyptyk, Dudley avenue, $1,800; G. Bremner, Cathedral avenue, $2,000; J. P. Watson, Athole, $2,500; A. Kantorvitch, Polson avenue, $8,400; E. L. Overdale, Arlington street, $3,000.

AWARDED.

Brantford, Ont.
Taylor & Taylor, architects, this city, have awarded the contracts for residences as follows: John Houlding, Brant County, $4,500; John Boughner, Copetown, $2,500; William Dyment, Copetown, $2,500.

Montreal, Que.
Lynch & Sharp, this city, have been awarded the contract for the erection of three houses, at the corner of Montrose and Clark avenue, Westmount, for Mr. A. D. Rosaire.

Business Buildings and Industrial Plants

Brandon, Man.
It is stated that George White & Sons, of London, Ont., manufacturers of farm implements and machinery, will erect a large warehouse in this city, starting construction as soon as the season opens up.

Brantford, Ont.
The premises of the Brantford Rag and Metal Company were damaged by fire last week.

Taylor & Taylor, architects, this city, are preparing plans for an addition to the factory of Gould, Shapley and Muir, Brantford, and for the proposed new factory for Harold Sanderson at Paris, Ont.

Coleridge, Alta.
$12,000 will be spent upon stock yards here this season.

Collingwood, Ont.
Robert Morrill is contemplating improvements to his shipyard.

Fredericton, N.B.
The Bank of New Brunswick are contemplating the erection of a new bank building.

Glace Bay, N.S.
The bottling works of McKinley & Ogilvie were destroyed by fire last week at a total loss of $12,000.

Hamilton, Ont.
Stewart & Witton, architects, this city, have been instructed by Southam, Limited, to prepare plans for a four storey fireproof building. Construction will commence at an early date. The plans include a gymnasium and large assembly hall.

London, Ont.
The premises of the Roberts Engraving Company were recently damaged by fire.

New Westminster, B.C.
It is stated that the C. P. R. have plans for the erection of large car building shops at Westminster Junction, and that operations will be started immediately.

Ponoka, Alta.
The elevator at this place was recently destroyed by fire.

Springhill Mines, N.S.
The building of F. L. Mills, general merchant, was destroyed by fire last week at a loss of about $3,000.

St. Johns, Que.
The premises of the St. Johns Straw Works were destroyed by fire last week.

St. John, N.B.
G. E. Fairweather, architect, is working on plans for a large new building to be erected by the proprietors of the Royal hotel. The building will be an addition to the present hotel and will contain 30 rooms. Construction will be started about May 1st.

Toronto, Ont.
A two storey brick store will be erected at 958 Bloor west by H. J. White at a cost of $4,000.

A new amusement park, to be known as Wolff's Park, is to be opened on May 24th near Sunnyside. There is a stone building in the grounds which will be converted into a restaurant. A special feature will be a dancing pavilion, 100 feet by 75 feet, fitted with hard maple floor, stage and 2,000 chairs.

E. Cronyn has a permit for alterations to offices at 90 Bay street. Estimated cost $4,500.

John Squire will put up a pair of semi-detached brick stores and dwellings at 1150 Bloor west at a cost of $6,500.

A permit has been granted to A. Care for a one storey brick laundry in Kimberley street. Estimated cost $3,000.

M. A. Hunter will build three attached two storey brick stores and dwellings on Macklem avenue at a cost of $6,500.

A permit has been issued to R. Bale for a pair of semi-detached two storey brick stores and dwellings on College street. Estimated cost $6,000.

A permit has been granted to P. P. Steele for a pair of semi-detached two-storey brick stores and dwellings on Broadview avenue to cost $6,000.

The Toronto Pharmacal Company, Limited, have obtained a permit for a three-storey and basement addition to their warehouse on King street to cost $6,200.

A permit has been granted to Robertson Bros. for a five storey brick factory and two storey brick boiler house on Richmond street. Estimated cost $40,000.

Thorold, Ont.

T. H. Wiley, architect, St. Catharines, Ont., has just taken tenders for alterations to J. T. Petrie's business block in this town.

Vancouver, B.C.

A site has been purchased on Westminster avenue by Mr. L. W. Shatford, who will ultimately erect a four storey business block.

The Fairview Cedar Lumber Company's sawmill, owned by John Hanbury, Brandon, Man., was recently destroyed by fire at a loss of $5,000.

Plans for a residential hotel, to be known as "The Towers," have been completed. The building is to be 100 feet square and will be situated on the corner of Georgia and Burrard. There will be six floors containing twelve suites each.

General Manager Sperling, of the British Columbia Electric Railway, has invited competitive plans from architects for the new office building at the corner of Carrall and Hastings streets which the company will erect during the coming season. The plans are to be in the hands of the company's management by April 26th. The building will be four storeys high. Operations will be rushed and it is hoped to have the structure ready for occupancy by next summer. The estimated cost is $250,000.

Victoria, B.C.

Balfour, Smye & Company, Hamilton, Ont., contemplate the erection of a six-storey distributing warehouse in this city.

Vancouver, B.C.

Several large structures are contemplated this month. The B. C. Electric Company have in view the erection of a large store room at the gas works to cost about $18,000, and the Victoria Creamery Company are about to take out a permit for the erection of their new buildings on Broad street, which with machinery and land will amount to an outlay of $35,000. In addition to these the Silver Spring Brewery Company, Victoria West, have plans for the erection of modern premises on the site of the old Fairall's brewery, Victoria West.

Welland, Ont.

The town has secured another industry and work will commence at once upon the erection of a factory for box making, etc. The principals of the company are W. J. Hickey and J. H. Lavallee.

Tenders for the erection of a manufacturing building for the Welland Stove Works, Limited, will be received until March 20th by T. L. Nichols, architect, this town.

AWARDED.

Hamilton, Ont.

The Ingersoll Construction Company have obtained from the Maple Leaf Amusement Company, a contract for the construction of nearly $40,000 worth of amusement devices at Maple Leaf Park. It is stated that considerable portions of the work will be sub-let. The structures to be built include a figure eight, estimated to cost $12,000; merry-go-round, $12,000; circle swing, $8,000, etc.

Welland, Ont.

The Page-Hersey Company, Limited, has awarded to the Berlin Construction Company, of Berlin, Conn., the contract for the erection of large mills at Welland for the manufacture of all sizes of water and gas pipes. The plant will be operated by electricity.

Power Plants, Electricity and Telephones

Belle Plaine, Sask.

The Stoney Beach Rural Telephone Company has been incorporated.

Brantford, Ont.

Application is being made for a charter for an electric railway to be constructed from Delhi to Burford, touching Kelvin, Northfield and Harley, and connecting with the proposed Brantford and Woodstock radial. Several Brantford promoters are behind the application.

The City Council on March 15th passed a by-law authorizing an agreement with the Catraract Power Company for the supply of lighting and power to the city for a term of five years. Under the new agreement the company furnishes street lighting at $48 per arc light per annum for 250 lights, a reduction of $7 per light on former figures; also domestic and incandescent lighting at 7.65 cents per kilowatt, instead of 9 and 10 cents as formerly charged.

Carieville, Sask.

A local telephone joint stock company has been formed at this place.

Chatham, Ont.

Important extensions to the northern and southern ends of the Chatham, Wallaceburg, and Lake Erie Electric Road are announced, subject to the decision of the American financiers who are interested in the proposition. The towns of Blenheim and Ridgetown on the south and Petrolia and Sarnia on the north will be tapped this summer.

Galt, Ont.

Engineer Hillman, of the Patterson Railway Company, Hamilton, is in the town arranging for the survey for the proposed Galt-Hamilton electric road.

Montreal, Que.

The deal was closed recently for the financing of the Stave Lake Power Company's project. The proposition is to develop the falls on the Stave river.

New Westminster, B.C.

A. O. Hall, C.E., is making a report on the proposed dam for the Vancouver Power Company. If the Prvoincial Government sanction the erection of the dam it will be constructed this year.

Port Arthur, Ont.

The Government has started to get matters into shape for the erection of the dams at Dog Lake, Port Arthur. To this end, H. G. Acres, hydraulic engineer for the Hydro-Electric Commission, is making the necessary concluding surveys preparatory to starting the work, A. L. Russell, who already has done the preliminary work and furnished the Commission with plans and detailed information with respect to the lake, river and grounds surrounding, accompanies Mr. Acres and participates in the work being done. In addition to building the dam, the outlet of the lake will be lowered, by blasting out the channel to a depth of some three feet, thus enabling the drawing off of considerably more water. We understand that instructions have been given to have the necessary roads cut out for taking in supplies to the site of the work.

Tillsonburg, Ont.

Application is being made for the incorporation of the Tillsonburg & Southern Counties Electric Railway.

Tillbury, Ont.

A new telephone company is being organized by the farmers of Tilbury East. The president is E. Foxton. The directors include J. N. Halliday, H. S. Lloyd, C. Armstrong, L. Brown, P. W. Ritchards, J. Phillips and D. W. Kett.

Vernon, B.C.

Mr. J. C. Kennedy, engineer-in-charge of the Slave Lake Power Company, Vancouver, recently visited Okanagan for the purpose of going over the site of the Coteau Power Company, and to verify the plans of their engineer, Mr. A. E. Ashcroft. Mr. Kennedy says that arrangements may safely be made for the development of 5,000 horse power required to operate a system of tramways in this district.

AWARDED.

Calgary, Alta.

The City Commissioners have awarded the contract for the steel poles required for the street railway to the Standard Supply Company at $32.50 each for 28-foot poles. The optional price was $41 each for poles of 30 feet in height.

Contracts for the street railway system amounting to more than $100,000, have been awarded by the City Commissioners as follows: Allis-Chalmers-Bullock Company, motor generator set and switchboard, $15,950, installed in the power plant. Their nearest competitor was the Fairbanks Company, who bid $6,150, for the generator set alone, but did not tender on the switchboard. The Allis-Chalmers-Bullock tender on the generator set was $6,085. Seven hundred and fifty horse power engine, Robb Engineering Company, Amherst, N. S., $14,300. The Belliss-Morcom Company were next with a triple expansion engine with the same power at about the same price. The 1,100 tons of steel rails, 400 tons of which will be 80 pounds to the yard, and 710 tons 60 pounds, Gorman, Clancey and Grindley, Calgary, who represent a steel manufacturing firm with headquarters in Lorain, Ohio. The amount involved reaches the total of $70,000, the price being $61.54 per ton. The 80-pound rail will be used on paved streets and the lighter steel on the unpaved streets. The East Kootenay Lumber Company will supply the necessary ties at the rate of 56 cents each. Pugh & Livingston, of Okotoks, Alta., also tendered for ties.

Edmonton, Alta.

The Crocker-Wheeler Company, Ampere, N.J., have received orders for two 400 k.w., 575 volt engine-driven railway generators for this city.

Iberville, Que.

The Northern Electric and Manufacturing Company, Limited, have been awarded the contract for supplying and installing a western electric alternator, exciter and switchboard equipment for this town.

Winnipeg, Man.

At a recent meeting of the Board of Control, Cecil B. Smith, the chief engineer in charge of the power plant construction, appeared with W. G. Chace, the resident engineer, before the board in regard to the tenders received for the construction of a transmission line from Point du Bois, and a telephone line and equipment for a repair shop. A motion was passed in favor of accepting the tender of the Williamson Construction Company and H. D. Williamson, of Toronto, at a lump sum, partly on an estimate basis, of $118,424. Of this sum, $83,424 is the estimate for steel, gravel, cement, etc., in the construction of towers. The motion also included a recommendation for the acceptance of the tenders of R. & D. McLeod for the construction of the telephone line. The McLeod Company's estimate was $23,421. The tender of the Stuart Machinery Company, at $1,544, for repair shop equipment was recommended for acceptance.

Miscellaneous

Annapolis Royal, N.S.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until March 23rd for the construction of three ice piers in the Annapolis river at this place. Plans and specifications may be seen at the office of C. E. W. Dodwell, Resident Engineer, Halifax, N.S.; E. G. Millidge, Resident Engineer, Antigonish, N.S., on application to the local postmaster and at the Department.

Chipman, Alta.

The Tofield council is contemplating the installation of a fire-fighting plant.

Clearwater, Man.

Tenders will be received up to March 30th for supply of plank, bridge timber and lumber required by the municipality for the year, 1909, to be delivered at the following places: Pilot Mound, Crystal City, and Purves. Address W. Cranston, Clerk.

Fort William, Ont.

Tenders will be received by N. Tessier, Secretary, Department of Public Works, Ottawa, until March 29th for supply of timber to be delivered at the mouth of the Mission river. Specifications and bills of timber may be obtained at offices of W. P. Merrick, Resident Engineer, Fort William, Ont.; J. G. Sing, Resident Engineer, Toronto; A. R. Decary, Resident Engineer, Quebec; J. L. Michaud, Resident Engineer, Montreal, and at the Department of Public Works, Ottawa.

Goderich, Ont.

Hon. Mr. Pugsley, Minister of Public Works, told a deputation from this place that the government fully realized the importance of developing the facilities of the Canadian lake ports, and that the harbor at Goderich would be improved as soon as funds were available.

Kildonan, Man.

Tenders addressed to G. F. Monro, Clerk, rural municipality of Kildonan, 449 Main street, Winnipeg, will be received until March 20th for well construction. Particulars on application.

Medicine Hat, Alta.

Tenders for drilling a gas well for the city will be received at the office of the City Commissioner and Engineer up to April 10th. (See Advertisement.)

Port Arthur, Ont.

It is stated that a project is being considered for the construction of a large dry dock here.

Toronto, Ont.

Tenders addressed to C. W. Postlethwaite, Harbor Master, 508 Board of Trade Building, will be received until March 24 for dredging required in Toronto harbor this season. Specifications on application.

The City Council have been asked to endorse a recommendation of the Board of Control that the Ontario Legislature be asked to empower the city to issue debentures, without submission to the ratepayers, to raise money for the following purposes: Winchester street bridge, $15,000; widening of Dundas street bridges, $47,000; site and building new northern stables, $30,000.

In an amended report upon the cost of the sea wall, boulevard, driveway, etc., from Bathurst street to the Humber, City Engineer Rust states that type A, a rock-filled wall, will cost $725,000, and type B, partly concrete and partly crib, will cost $920,000. With the filling, sidewalks, driveway, bridlepath, etc., complete type A would cost $2,450,000, and type B $2,650,000. From Bathurst street to a point west of Cowan avenue the wall will be 500 feet from the shore, and from west of Cowan avenue to the Humber, 200 feet.

The Island Committee recently considered the Park Commissioner's plan for the improvement of the Island, and decided that the ratepayers should be asked to vote $100,000 for that purpose. The committee decided against a tunnel under the Western Gap, at a cost of $235,000, and a drive around the Island at a cost of $50,000. The cost of the improvements as proposed by the Commissioner would be:—Bridges, $50,000; bathing houses, $30,000; shelters, $25,000; boat houses, $20,000; refectory, with club dressing room, $10,000; earth surfacing of made ground, $20,000; cinder and gravel pathways, $25,000; dredging channels and grading, $15,000; plants, shrubs and planting, $10,000. Total, $185,000.

Winnipeg, Man.

Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until March 24th for the supply of Air Lock for well number seven, f.o.b. cars, city yards, or delivered at well side, Kildonan. Specifications may be obtained at office of City Engineer Ruttan.

AWARDED.

Hamilton, Ont.

The Smart-Turner Machine Company, 191 Barton street E., Hamilon, report the following recent orders: Duplex pumps from the Doty Engine Works, Goderich; Intercolonial Railway, River du Loup, Que.; Collingwood Shipbuilding Company, Collingwood; Rainy River Lumber Company, Port Arthur; E. Long Manufacturing Company, Orillia; Georgian Bay Stock Mills, Midland; McLaren's, Hamilton; Helena Costume Company, London. Centrifugal pumps from Corporation of Medicine Hat; simplex vacuum pump, from Robt. Watson Company, Toronto; rotary feed pump and receiver for Technical School, Hamilton; jet condenser and duplex pump from Selby & Youlden, Kingston; rotary pump from Domestic Specialty Company, Hamilton, and an order for oil pump from McColl Bros., Toronto.

Peterborough, Ont.

The contract for the operating machinery, pivots and anchorages for 24 locks on the Trent Canal has been awarded by the Department of Railways and Canals to the Wm. Hamilton Company, of this city, at about $80,000.

Red Deer, Alta.

The Town Council have awarded to Wood, Gundy & Company, Toronto, $19,400 six per cent thirty-year bonds, issued for local improvement purposes.

Victoria, B.C.

Wood, Gundy & Company, Toronto, have been awarded $265,000 4 per cent. 50-year debentures, for which tenders were received up to the 1st inst. The debentures are issued for the purpose of constructing surface drains and sewers, and for increasing the present school accommodation.

New Companies

H. W. Petrie of Montreal, Limited, Montreal, Que., capital $40,000. Incorporators, W. Laurie, T. P. Altimas and M. A. Phelan, all of Montreal; A. W. Ryan, Westmount, Que., and H. W. Petrie, Toronto, Ont.

Amalgamated Asbestos Corporation, Montreal, Que., incorporated, capital, $10,000,000. Incorporators, J. W. Cook, A. A. McMaster, R. P. Doucet and A. A. McGee, all of Montreal.

McPhail & Wright Construction Company, Limited, Sault Ste. Marie, Ont., incorporated, capital, $50,000. Incorporators, D. P. McPhail, John A. McPhail and Kenneth Wright, all of Sault Ste. Marie.

McGregor & McIntyre, Limited, Toronto, Ont., incorporated to manufacture and deal in structural and ornamental work, etc., capital $300,000. Incorporators, J. H. McGregor, R. L. McIntyre and C. E. Disher, all of Toronto.

Siemon Company, Limited, Toronto, Ont., lumber manufacturers, capital $1,000,000. Incorporators, J. C. Siemon, W. R. Tudhope and Ralph H. Fillmore, all of Toronto, and J. Siemon, Jr., and Andrew Siemon, both of Wiarton, Ont.

Western Dry Dock and Shipbuilding Company, Limited, Toronto, Ont., incorporated, capital $1,000,000. Incorporators, J. H. Spence, C. E. H. Freeman and A. Singer, all of Toronto.

Business Notes

H. M. Petrie & Company, lumber dealers, Quebec, Que., have registered.

The D. W. Mitchell Construction Company, Limited ,Niagara Falls, Ont., have obtained a charter; also the Huntsville Engine Works Company, Limited.

Letters patent have been issued at Ottawa increasing the capital stock of the Park Patent Nailless Horseshoe Company, of Montreal, from $20,000 to $250,000, and of the Standard Fitting & Valve Company of Canada from $100,000 to $200,000.

Incorporation has been granted Menzies and McIntyre, Limited, for the purpose of taking over the business for the manufacture of stone carried on by Menzies and McIntyre. The capital of the company is $20,000, and head offices are in Winnipeg.

Tenders and For Sale Department

Canadian Agents Wanted

A British firm manufacturing Tiles, Mosaics, Faience, Terra Cotta, etc., wants Canadian agents in Toronto, Winnipeg, Montreal and other large cities. Correspondence confidential. Box 140 CONTRACT RECORD, Toronto. 12

Tender for Library

Sealed tenders marked "Public Library Tender" and addressed Secretary of Calgary Public Library, P. O. Box 1827, Calgary, Alberta, will be received up to noon of

Thursday, April 15th,

for the erection of a Public Library in the City of Calgary.

Plans and specifications may be seen at the Court House, Calgary, (Sheriff's Room) up to 4 p.m., April 14, 1909.

Copies of the specifications may be obtained from the undersigned upon payment of the cost of transcription.

The lowest or any tender will not necessarily be accepted.

By order of Board,
12 E. L. HILL, Secretary.

Temiskaming and Northern Ontario Railway Commission

Sealed tenders addressed to the undersigned and marked on the envelope "Tender" will be received up to 12 o'clock noon on WEDNESDAY THE 17TH MARCH for the following works:—

1. **Engine House and Machine Shop at Cochrane.**
2. **Locomotive Foreman's Office and Petty Stores Building at Cochrane.**
3. **Heating Plant for Cochrane Roundhouse and Machine Shop.**
4. **One 75 ft. Turntable complete at Cochrane.**
5. **Coal Shed and Trestle at Cochrane.**
6. **Culvert near Mileage 22½.**
7. **5 ft. Arch Culvert near Mileage 50¾.**
8. **20 ft. I Beam Span near Mileage 62½.**
9. **20 ft. re-inforced Concrete Arch Culvert near Mileage 222½.**
10. **One 8 ft. re-enforced Concrete Arch Culvert near Mileage 221.**
11. **One 11 ft. re-enforced Concrete Arch Culvert near Mileage 218½.**

Plans and specifications may be seen at the office of the Secretary-Treasurer, 25 Toronto St., Toronto, or at the office of the Chief Engineer, North Bay.

Forms of tender and amount of deposit necessary in respect of each item can be obtained on application to the Secretary-Treasurer at above address.

Lowest, or any tender, not necessarily accepted.

A. J. McGEE,
Secretary-Treasurer.

25 Toronto St., Toronto,
February 22nd, 1909.

Papers inserting this advertisement without authority will not be paid for same. 11

City of Brandon

Tenders for Cement

Sealed tenders, endorsed "Tenders for Cement," will be received by the undersigned until 4 o'clock, p.m., FRIDAY, APRIL 16TH, 1909, for the supply of One Thousand to Two Thousand Barrels of "Portland" Cement, for the City of Brandon for the coming season.

Specification and form of tender may be obtained on application to W. H. Shillinglaw, City Engineer, Brandon.

The lowest, or any tender not necessarily accepted.

HARRY BROWN,
City Clerk.

Office of City Clerk, March 4th, 1909. 11

City of Calgary

Tenders will be received by the Commissioners of the City of Calgary, addressed to the undersigned, marked,

"Tenders for Sewer Pipe or Water Pipe"

up to 4 p.m. of the 22ND DAY OF MARCH, INST., for supplying the City of Calgary with the following:

Sewer Pipe—Single and Double Stength

4″ ft.	6″ ft.	8″ ft.	9″ ft.	10″ ft.
26,000	8,250	2,416	3,100	13,270
12″ ft.	18″ ft.	20″ ft.	24″ ft.	30″ ft.
8,400	5,480	2,200	5,246	9,200

Specials—Ys, Ts, and Bends

1,250 350 100 125 700 350 250 100 220 400

Water Pipes—All Sizes

6″ Pipe	12″ Pipe
41,140 Lin. ft.	5,000 Lin. ft.

The Commissioners do not bind themselves to accept the lowest, or any tender.

H. E. GILLIS,
City Clerk.

Dated at Calgary, March 1st, 1909. 12

Town of Fort Frances

Ontario

Tenders Wanted

Sealed tenders will be received by the Town Clerk until 8 p.m on THURSDAY THE FIFTEENTH DAY OF APRIL, 1909 for certain materials for Water Works and Sewerage Works as follows:

Contract "A" **All labor necessary for constructing the water works distribution system and certain materials therefor.**

Contract "B" **All labor for constructing sewerage system and certain materials therefor.**

Contract "C" **The supplying of cast iron pipes, and special castings.**

Contract "D" **The supplying of gate valves and hydrants.**

Contract "E" **The supplying of vitrified tile pipe.**

Contract "F" **The supplying of manhole covers, etc.**

Plans and specifications may be seen at the office of the Town Clerk, Fort Frances, also forms of tender may be had on application to the Town Clerk.

W. H. ELLIOT,
Town Clerk.

H. WILLIAMS, Esq.,
Mayor of Fort Frances. 12

Notice to Contractors

Tenders will be received by the Alvinston School Board until FRIDAY, APRIL 2ND, for a Hot Air System of Heating, including proper ventilation for the use of the Alvinston Public School. The lowest or any tender will not be accepted unless otherwise satisfactory.

13 ALEX. M. PHAIL, Secretary.

Tenders for Cement Walks

The Board of Works of the Town of Berlin will receive tenders up to MARCH 31ST, next, for constructing Cement Walks during the year 1909. Specifications may be seen at the office of the Town Engineer, Wm. Mahlon Davis.

The lowest or any tender not necessarily accepted.

NICHOLAS ASMUSSEN,
Chairman

Berlin, March 12th, 1909. 12

To Contractors

Tenders will be received at the office of the undersigned up to noon on SATURDAY, MARCH 20TH, for work of all trades required in the completion of an Apartment House in Madison Avenue, Toronto, to be known as Devonshire Court.

No tender necessarily accepted.

SYMONS & RAE, Architects.
11 15 Toronto Street.

Tenders for New School Building

Tenders for the erection of a four roomed school in the town of Ingersoll, Ontario, will be received up to SATURDAY, NOON 27TH, MARCH, 1909.

Plans and specifications may be seen at the office of W. A. Sudworth, Secretary of Board of Education, Ingersoll, Ontario, or at the office of Taylor & Taylor, Architects, Brantford, Ontario.

All tenders to be addressed to H.F. Boyse, Esq., Chairman of property Committee, Ingersoll, or to Taylor & Taylor, Architects, Brantford, Ontario.

The lowest or any tender not necessarily accepted. 12

City of Medicine Hat

Tenders for Gas Well

Tenders for the drilling of a well for the city will be received at the office of the undersigned up to APRIL 30TH, 1909.

Tenders to be given as follows: The contractors to furnish all labor, pipe, machinery and material; anchor and sheet in well in a practical manner.

The city to pay for all pipe, which is necessary to leave in the well or the contractor may tender to furnish labor only, anchor and sheet in well in a practical manner.

Specifications may be obtained by applying to undersigned.

W. P. MORRISON,
14 City Commissioner and Engineer

The Albert Manufacturing Company of Hillsboro', N.B., is once more opening at McKinnon's Harbor. Last year about 1,500 tons of gypsum were quarried out for shipment by water, but as the harbor is not navigable until dredged, the works had to be suspended. The dredging was done in the fall, and the company are looking for activity in the plaster line as soon as spring opens. Three miles of railway will be built, and when summer comes the company expects to be ready for shipment. At present the superintendent, Mr. Steeves, is quarrying on several different properties, which will be shipped first for testing purposes.

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Vol. 23 Toronto, March 17, 1909 No. 11

The Outlook for Spring

With the advent of spring the thoughts of those connected with the building trade turn towards the season's prospects. For some time now, things have been steadily progressing. Following a capital crop came an open winter, one of the mildest in years. It would seem that Providence is making special efforts in our behalf to permit of our recovering from the recent depression.

There is no highly colored optimism here. The advantages to the building trade of such a winter as that of 1908-9 cannot be gainsaid by any live builder. Opportunities are not to be discounted because some are foolish enough to miss them. The keynote of success is the faculty of recognizing and taking opportunity. Generally speaking, the trade has awakened to the benefits of the departing winter and in so doing has made a stepping-stone for greater success later in the year.

At all points there are material evidences of the acumen of the building trade in Canada. Returns, showing the standing of the building industry in Toronto during January and February, indicate that the approximate cost of buildings for which permits have been granted is $1,233,060, as compared with $733,093 last year. During February alone the value was $853,035, as compared with $258,640 for the same month last year. The number of new buildings erected in Toronto during January and February of the current year was 476, against 288 in the corresponding period of 1908. It is noteworthy that the total for last month is the largest figure for February in the history of the city. There were, and there are, exceptional opportunities for getting busy in the building line and it is gratifying to know that so many Toronto builders are men of the moment.

Winnipeg is another example of enterprise and progression. The architects' offices in the Western metropolis are reported to be veritable hives of industry. All are crowded with work, preparatory for one of the busiest building seasons in Winnipeg's history. It is doubtful if ever before so much work was in sight at this period of the year, and the majority of the buildings are of a costly and substantial type. Although the season for building has not yet opened there are plain indications that Winnipeg is to experience one of the greatest years for growth and improvement is has ever known.

From Vancouver, also, comes news of great activity, and it is expected that 1909 will record a great increase over the best building year yet known. Everyone who is familiar with the Contracts Department of this journal and who notes the weekly list of projected works, will concede that the Vancouver people are justified in their expectations.

Similar reports continue to come in from all quarters of the Dominion. The builders of the Maritime Provinces seem to be as keen this year as those of the West. Contractors in the little jumping-off places are as optimistic as their city brethren in a bigger way of business.

From whence come these conditions?

They come from a feeling of relief that the depression has passed away and from a sense of gratitude that all things point towards recovery. They come with easier money and improved labor conditions. They come with the promise of busy months and the assurance of better times. They come with spring.

Misapplied Prison Labor

The Frontenac County Council have arrived at a fresh solution of the prison labor problem. It follows that in so doing they have encroached upon some regular industry. This time it is tile-making. The prisoners are now employed in making tile for the new roads to be built throughout the county. For some time the Council has been hard set to find suitable and congenial employment for its involuntary guests. Whenever an idea has turned up it has been sure to offend someone, a clear indication that the ideas were very limited in their conception.

In the manner in which the authorities treat certain questions, including the one under discussion, they resemble a familiar type of schoolboy who seems to have a remarkable propensity for dogged perseverance in error and avoidance of right. The prison authorities' offence is not the first of its kind. The shoemakers, manufacturers of brooms and binder twine, and others, all had their share of the trouble in competing with prison labor. They, however, in turn, repudiated their share so strenuously that the authorities were persuaded that they had transgressed and the prisoners' programme was rearranged each time. When difficulties arise, either individual or corporate, there is too often a disposition to choose the least of many evils rather than a determination to arrive at the right solution. It seems to be so with the Frontenac people. They evidently think that the tile makers will be less apt to object, and are putting them to the test.

Now, "what is sauce for the goose, is sauce for the gander," and vice versa. It was conceded to be an injustice to the shoe manufacturers to set the prisoners to make footwear, and the tilemakers are therefore equally wronged in the present instance. They should take a firm stand and let the Frontenac Council know that it is trespassing on private ground. It is not necessary for the manufacturers to suggest a remedy, or even to hint that local improvements and road-making would provide more suitable employment than carrying wood to and fro across the yards, which seems to have been the prisoners' diversion for some time.

The authorities must discover the proper remedy and not make a scapegoat of any industry connected with the building trade.

Personal News and Notes

Mr. J. G. G. Kerry, the newly-elected president of the Toronto branch of the Canadian society of Civil Engineers, whose portrait is published herewith, is one of the best known of the younger members of the profession. Mr. Kerry graduated in 1886 in the honor class of civil engineering at McGill University. From 1886 to 1888 he was employed on railway location and construction by the C.P.R. From 1888 to 1889 Mr. Kerry was on the engineering staff of the Montreal Harbor Board. From 1889 to 1890 he was engaged in the location of surveys for the Edmonton Railway. From 1890 to 1893 he was on railway construction in South Carolina and West Virginia. From 1903 to 1907 Mr. Kerry was on the teaching staff of McGill University, in the department of surveying and railway engineering. From 1903 to 1907 he was also engaged on surveys and construction for the East Liverpool Bridge Company, Ohio. Mr. Kerry also carried on from 1899 to 1907 a private practice as a consulting engineer, giving his attention particularly to steam railway construction and location, and work of a general nature, under the direction of Mr F. H. McGuigan, then 4th Vice-President of the G.T.R. From 1907 he has been a partner of the firm of Smith, Kerry & Chace, consulting engineers, Toronto.

Mr. J. G. G. Kerry, President Toronto Branch, Canadian Society of Civil Engineers.

During 1907 and 1908 Mr. Kerry was a member of the Quebec Bridge Commission. At present he is president of the Seymour Power & Electric Company, Campbellford, and general manager of the Northumberland Paper & Electric Company. The firm of Smith, Kerry & Chace are engaged at present as consulting engineers for designing and constructing works for the cities of Lethbridge, Nelson, Portage la Prairie, Winnipeg and Port Arthur, and for the Dufferin Light & Power Company, Orangeville, the Seymour Power & Electric Company, Campbellford; Mines Power, Limited, Cobalt; Nipissing Power Company, North Bay, Ont.; Crane Falls Power & Irrigation Company, Idaho, and as engineers for the McGuigan Construction Company, building the transmission system for the Hydro-Electric Commission for the Province of Ontario.

A general shake-up in the civil engineering staff of the Grand Trunk Pacific Railway took place at Portage la Prairie recently, when practically all of the engineers and their assistants received notice that their services would be no longer required. District engineers R. P. Graves, of Wainwright; Sherman, of Portage, and Resident Engineers R. H. Smith, of Melville; H. G. Jamieson, of Rivers, and W. M. Cairns, of Portage, are affected by the move, and with each is a staff of not less than four men. The company give as a reason that they do not wish to continue the work through the remainder of the winter, and they announce that the work will open up April 15. J. N. DeStein was the only engineer to be retained, and his work will consist of a general supervision of the company's lines and work between Winnipeg and the front. He has engaged as one of his assistants Mr. E. S. Farrell. In connection with the change another appointment has also been made, namely, that of W. J. Weir, as supervisor of the bridge and building department, his territory to extend from Winnipeg to Wainwright.

A general special meeting of the members of the Architectural Institute of Canada will be held on Tuesday, April 6th, at 10.30 a.m., in the rooms of the Ontario Association of Architects, 94 King street west, Toronto, for the election of a vice-president; lecture by Messrs. H. B. Gordon, F.A.I.C., and J. P. Hynes, F.A.I.C.; the opening of a letter-ballot for the admission of associates and the transfer of associates to the class of fellows, and the transaction of any business that may arise.

A meeting of the council will be held at 9 a.m. for the consideration of applications for membership into the institute and the transaction of any business that may arise. A second meeting of the council will be held at 2.30 p.m., to meet the representatives of the various Canadian architectural bodies respecting the federation of the architectural societies of the Dominion.

Mr. Walter R. Strickland, a well known architect of Toronto, had a narrow escape from death on King street, opposite the King Edward Hotel, recently. He was crossing the street when he was struck by an eastbound King street car. The car was not moving very quickly, and he was picked up on the fender. He was thrown off, however, on the devil-strip, and fell immediately between the eastbound and a westbound car. He was thrown on his face, lengthwise on the devil-strip. Both cars were stopped. When picked up, Mr. Strickland was unconscious. He was taken to his home in a carriage, but it is feared that on account of his age it will take him some time to recover.

Mr. M. Visvesvaraya, superintending engineer of the Public Works Department, Bombay, India, was in Toronto recently. He is making investigations into the systems of sewage disposal in a number of the leading Canadian and United States cities, the city of Bombay having decided to improve the system they now have, which is similar to the Toronto system of sewage disposal. The crude sewage of Bombay is deposited in the harbor.

Mr. H. D. Bayne, eastern manager of the Canadian Westinghouse Company, Limited, has resigned.

Recent Interesting Legal Decisions

Payment for Architect's Plans.—The case of Erb v. Dresden Public School Board, which recently came up on appeal by the plaintiff and cross-appeal by the defendants from a judgment of Judge MacMahon dismissing the action without costs, was heard and judgment was given by Judge Britton. The action was one to recover for plans and specifications prepared by the plaintiff, as architect, for the defendants for a new public school building which the defendants proposed erecting at Dresden, Ont. The trial judge had dismissed the action on the ground that the expenditure for plans and specifications was not within the power of the school board and therefore not binding upon them. Judge Britton held, however, that he was of opinion that it was quite within the power of the trustees of public schools to employ an architect for hire to prepare plans, etc., for a proposed school house. He regarded the plans and specifications as a necessary prerequisite to building, and even to an application of the municipal council, and to submitting a by-law to the people. The ratepayers were entitled to know, and it was the duty of, or certainly within the power of, the trusttes to obtain and submit plans and specifications. He thought therefore that the plaintiff should be paid. It was rather difficult just to say how much. The instructions of the plaintiffs limited the work very much. The drawings required were as follows: Basement, first floor, second floor, south elevation and perspective from the north-west. The drawings were to be executed to minimum scale of one-tighth inch to foot, and finished in line only, without shading in India ink. The ordinary percentage charge for what was done would not be proper in this case. It was a plain building, but would have cost a large sum of money because of its size. Upon the best consideration he could give therefore, Judge Britton said that the plaintiff should get $125 with costs of action and appeal. Judge MacLaren agreed with Judge Britton, and Chancellor Boyd dissented, holding that the evidence failed to prove the contract made between the plaintiff and the defendants by which they were liable to pay for the plans. Assuming, however, that the plaintiff should be paid therefor, the Chancellor was of the opinion that he was not entitled to more than $40 with costs.

Lien Upon Machinery.—The case of Petrie v. London & Western Trusts Company was recently heard in the Court of Appeal for Ontario. The case arose over a claim made by the plaintiff respecting machinery which he had sold to Kurtze & McLean, Limited, under an order by which the property in the machinery was not to pass from the vendor until all moneys payable under the order of sale had been fully paid and satisfied. Petrie omitted to file a copy of the lien order with the clerk of the county court, and some of the machinery supplied had not his name and address upon it, as provided by the Act. The machinery was for a factory in the city of Stratford, for which the purchasers were to receive a bonus of $10,000 in city bonds, and to give a first mortgage on the land, machinery, etc. They found that they could not give a first mortgage because of the lien, and a change was made in the terms of sale. Doubt arose as to the actual existence of the lien in favor of Petrie, and the latter held that he had sold the machinery under lien, but that his draft, made for $2,458.20 at one month, was to be paid out of the city money and that he was then to give a release. The case came before Judge Teetzel, who upheld Petrie's lien as to the articles which bore his name and address at the time of delivery, and, on account of the want of filing a copy of the document in the clerk's office, disallowed it as to those that were not so marked. The Court of Appeal dismissed the appeal and the cross-appeal with costs and affirmed the judgment of Judge Teetzel.

Responsibility for Accident in a Sand Pit.—In the Court of Appeal for Manitoba a case recently arose relating to the death of a person who was taking sand from a sand pit. The case was that of Roy v. Henderson. The defendants were the owners of the pit, and were selling sand out of it to the deceased and to other customers. So much sand had been taken out that the roof of the pit projected some five to seven feet, and while J. B. Roy was loading his sleigh box the roof fell upon him, causing injuries from which he died. The original judgment was given by Judge Macdonald, and the appeal judgment by Chief Justice Howell. Chief Justice Howell agreed with the trial judge that the defendants were bound to keep the premises reasonably safe for the customers. The deceased was simply doing what he was invited to do by the defendants, and mere knowledge of the danger did not disentitle the party injured from recovering. It seemed to the Chief Justice, however, that he could not avoid the conclusion, although with some doubt, that as the deceased did not require the defendants to do their part, and as he knew of the danger, the appeal should be dismissed with costs. As the appeal was from a judgment dismissing the original action, the case for the plaintiff was therefore lost.

Encroachments of a Building on Adjoining Lot.—The case of Barry v. Desrosiers recently came up on an appeal and cross-appeal from the judgment of Judge Morrison in a case to recover a portion of a lot of the city of Vancouver encroached upon by defendant's building to the extent of three-quarters of an inch. It appeared that in the fire of 1885 all the survey posts in that locality were burned, and on re-survey the block in which the lot in question was included was found to be six inches short, according to the original survey. A "general average" seemed to have followed in apportioning the shortage among the lots. Judge Morrison had given judgment for the plaintiff for $100 in full compensation. The plaintiff appealed, seeking an amendment by the insertion of an order for possession of the land encroached upon, and the defendants cross-appealed to have the action dismissed. Judge Clement held that inasmuch as the lot-stakes had long since disappeared it became a pure piece of guess work to locate the latter error and therefore dismissed the action with costs, allowing the appeal of the defendants.
with costs.

Compensation for Lowering Level of Street.—Judge Clement recently granted an order for the appointment of an arbitrator for the city of Vancouver in connection with the application made by the Roman Catholic Bishop of New Westminster. The city corporation had lowered the level of two streets upon which certain property vested in the Bishop abuts, and the applicant, deeming himself entitled to compensation, commenced arbitration proceedings. Judge Clement said that the Court leaned to a construction of the Act which would afford adequate protection to the private citizen, and accordingly granted the application.

The Science of Testing and Inspecting Cement

Interesting Paper Read at the Recent Toronto Convention by Mr. J. E. Moore, of Chicago.

Testing and Inspecting.

An interesting address was delivered before the convention of the Canadian Cement and Concrete Association by Mr. J. E. Moore, inspecting engineer for Robert W. Hunt & Company, Chicago, who spoke upon tests and inspection of cement. Mr. Moore said that he thought the science of testing had kept pace with the advances which had been made in the other branches of cement work. This was due to the fact that societies had spent many years in developing ideas, until the present specifications of the Canadian and the American Societies of Civil Engineers were about as perfect as could possibly be expected with the present state of the industry. A few years ago, he thought, manufacturers had not looked quite so keenly on the inspecting and testing of their product as they do now, but to-day, he believed, manufacturers realized that it was to their interest as well as to the interest of the consumer to have their products tested. In the first place they could assume that the manufacturers of cement were in the business to stay. Inspection was a sort of additional check by the testing of the cement at the cement mill, because then the men who were responsible for the composition of the cement knew that when stuff went out which was not right some one was going to hear about it. There was a great deal of testing of cement done in the field, very often by the superintendent on the job. These tests were all right so far as they went, and very often were entirely sufficient, but he believed that wherever some small fault was found with the cement under a test made by a partially experienced man on the job, the matter ought to be gone into further before the cement was rejected.

The selection of samples was obviously something that ought to be very carefully looked after because it was just as easy to get a sample of cement which was not representative, as anything else. Most cement nowadays was shipped in sacks and the sampling was done at the mill, the warehouse or at the side of the work. Personally, he thought it was a very good idea to sample cement at the mill wherever possible. In the first place they gained the time while the cement was in transit, and then if any unsoundness was noticed which was shown up by the accelerated tests, nearly all mills would delay a car of cement 24 hours to enable the tester to get out his hot test. This test could be finished in very little over 24 hours and there was much less chance of any cement which might afterwards have to be rejected leaving the mill at all. Cement which had been damaged by water and was so hard that it became lumpy and the lumps would not break up, ought to be rejected. Speaking of chemical analyses, Mr. Moore said that these were seldom made unless one suspected adulteration or something of that sort, and he was glad to say that nowadays they did not suspect adulteration very much. As a rule one analysis of cement would go a long way on account of the uniformity of the product. A cement might analyze perfectly, according to the accepted variations allowed in the different constituents, and yet be sadly off from being a sound cement. If the burning had not been properly done or the mixing not thoroughly attended to, or, coming back to the first stage of the manufacturing, if the raw materials had not been very carefully pulverized almost to an impalpable powder, and thoroughly mixed, the unsoundness might not show up in the cement but it would show up in some one of the tests.

Another test which was frequently made was that of specific gravity. Specific gravity would change materially from the time of manufacture until a few months later, especially if the cement was exposed to moisture, and the determination of specific gravity was likely to be misleading because of the taking up of a small amount of moisture or of carbonic acid from the atmosphere.

As to the fineness test, the specifications required that not over 8 per cent. should remain on a 100-sieve, and not more than 25 per cent. on a 200-sieve. He had made a great number of experiments upon the residues that remained on the various sieves. The cement on a 100-sieve, while very fine and almost fine enough to pass the 100, would yet have almost no hydraulic qualities. It would set up very slowly. The life and essence of cement was the very fine impalpable powder and that was the reason why so much stress was now laid on the fineness of grinding. The manufacturer would grind probably now, fully 25 per cent. or more, finer than he did five or ten years ago. Naturally the larger amount of impalpably fine powder there was in the cement the more particles of sand it was capable of coating and, therefore, the greater would be its sand carrying capacity. The size of the wire in the sieve was a very important matter because they might have 100 meshes per linear inch to the sieve, but if the wire was not of the specified gauge the meshes might not be anywhere near to size. Therefore the specifications insisted that the wire should be of a certain gauge.

The setting time for cement varied a great deal. Often it was varied purposely by the manufacturer to correspond with the season of the year in which it was to be used. For instance, at this time of the year, in cold weather, the manufacturer often had a demand for quick setting cement, and in summer a demand for the opposite kind. The setting time was determined as a sort of gauge to find out whether the cement was safe to mix and put into the work previous to the time when it began to take its initial set. After this initial set had taken place, disturbances of it were attended by a specific loss of strength, possibly to a dangerous degree. The setting time of cement when made in the laboratory was also influenced a great deal by the differences in temperature of the water, the amount of water used, and differences in temperature of the room. Therefore, all these points were carefully taken care of in the specifications by stating that the temperature of the room and the water used should be as near as possible to 70 degrees Fahrenheit.

Uniformity of Sand for Testing.

Mr. Moore then dealt with the matter of the quality of sand used in testing. For the purpose of comparison in the laboratories it was absolutely essential to use the same kind of sand. The sand which was used was a pure white silica sand which had been sieved and passed through a 20-mesh sieve and remained on a 30-mesh sieve. This provided a sand which was extremely uniform. Another thing which was very necessary in making tensile tests on cement to obtain uniformity of results in different laboratories was uniformity of method of manufacture of the products. This had been standardized and the amount of water to be used in mixing the mortar, both in the neat cement and in the sand mixtures, had been specified within certain limits, so that tests from different laboratories were expected to agree rather closely with one another. A great number of times samples had been prepared by mixing a large amount of sand and sending a portion to a number of different laboratories to find out whether there was any chance of getting close together in the results. While one or two would generally disagree as to the strength, on the whole the results agreed quite closely. They had to thank for that the fact that the methods for making tests had been so standardized.

The next test was that for constancy of volume. This was one of the most important tests which were made on cement and one which was almost invariably made because it gave information regarding the soundness of the cement in a very short time. In the United States, although they did not have a large percentage of rejections for any cause whatever, perhaps there were more temporary rejections for unsoundness than for anything else. These tests were made by making up pats of neat cement with a certain amount of water, about one-half inch thick in the centre and tapering to the at the mill, the warehouse or at the site of the work. edge, on a little plate of glass. After remaining in moist air for 24 hours, one of these is put in water of normal temperature for a period of 28 days and observed from time to time; another for the accelerated test is placed in boiling water or steam for a few hours. For the steam test they were placed in a little vessel over boiling water and exposed to the action of the steam, the temperature of which, of course, was nearly at the boiling point. Sometimes this test was carried a little further by lowering the pats, after the steam, into boiling water for a few hours. This boiling test would certainly bring out any unsoundness Unsoundness was due perhaps to a little free lime. This was one of the commonest forms of unsoundness. This test would show up unsoundness which possibly might take weeks to develop under normal conditions.

Tests of this sort, although heroic, were safe. Some manufacturers, indeed, claimed that it was not fair to reject cement because of unsoundness shown up by the steam test. Nevertheless it was a safe proposition to hold such cement until some further test could be made. Mr. Moore had personally been engaged in the testing of cement for about twelve years and had seen a great many improvements made in methods during that time. He believed that the testing of cement had come to stay, increasing as it was from year to year. People realized that for a comparatively small sum they could feel certain that the cement which they were putting into their work was proper. There was every assurance that cement which filled the requirements of the standard specifications of the Canadian and American Societies of Civil Engineers was fit for any work that it might be desired to use it for.

The Meaford Wheelbarrow Company, Limited, Meaford, Ont., have secured the Canadian rights to manufacture the line of roller bearing wheelbarrows and concrete carts made by the Sterling Wheelbarrow Company, of Milwaukee, Wis. These goods are known to the trade, having for some time been sold exclusively by Messrs. Mussens, Limited, of Montreal.

Echoes of the Convention

The Industrial Chemical Company, of Swansea, advertised their well known "Kantleak" to good advantage.

Robert W. Hunt & Company's booth was a centre of considerable interest. This firm's Montreal office is now equipped with cement and chemical laboratories.

The Wadsworth-Howland Company, Boston, Mass., were exhibitors of "Bay State Brick and Cement Coating" for protecting and decorating cement surfaces.

Thomas McQuain, Davisville, North Toronto, Ont., exhibited a combination cement block building machine. This is a side face machine. The blocks are made as they are laid on the wall. There can be two mixings used in this machine, the fine on the front side of the core, and the coarse on the back. Two veneering blocks can be made at one operation, as both sides of the block can be made to face if necessary.

"Star Brand Portland Cement" was probably the first exhibit to catch the eye of a visitor. The booth was most attractively arranged and the passerby naturally paused to take in the surroundings. Samples of the company's product were, of course, on exhibition. The booth was nicely decorated with views of the plant and other interesting scenes. "Star Brand" was kept to the fore all week.

Exhibit of Canadian Portland Cement Co., Limited.

F. M. Jackson, Akron, N.Y., had an exhibit showing "The Jackson System" for concrete building. This system is used for residence, office, factory and warehouse construction, and is claimed to be fireproof, damp proof, and very economical. The system is patented in the United States and Canada.

The LaGrange Specialty Company, La Grange, Ind., exhibited the "Little Giant" cement brick machine for making plain or fancy, ornamental or round cornered brick by the use of removable forms. By coloring the cement, any shade of brick can be had. The capacity of the machine is claimed to be 100 brick per hour.

The Senator Mill Manufacturing Company, of Galt, exhibited the St. Clair mixer, for which they are general agents. Among the advantages claimed for this machine are: Hopper and chute both detachable, simply lifted off, saving time; combined roller and gear drive, balanced load, little friction, saving power; perfect acting chute, allowing no drippings. The St. Clair is made in four sizes, with or without trucks.

The Need of Greater Publicity for the Clay Trade

Direct Pointers for Manufacturers and Supply Firms—Status of Trade Journals

At the annual meeting of the National Clay Machinery Association, held at Rochester, N.Y., last month, Mr. F. L. Hopley, advertising manager for the American Clay Machinery Company, read an interesting paper upon the advantages for the clay trade to be derived from advertising. Mr. Hopley's remarks were in part as follows:

To my mind a good advertisement is always a pleasure to behold, a bigger pleasure if it is our own, but still a pleasure even though it's the other fellow's. Those of you who expect to hear from me specific directions as to the short road to succesful advertising, may as well go to sleep. There are, however, points where the interests of the members of this association are mutual in an advertising way, and in a few brief observations I hope to touch upon one or two of them.

Benefits to be Derived.

There is no question as to the benefits to be derived from advertising, but the question as to what class of advertising is most beneficial and as to what should be eliminated is a serious one and a problem which not only worries the advertising man, but is equally interesting to the man who pays the bills.

There is no disputing the fact that much of the advertising that is done is not of sufficient benefit to justify the expense. It brings results, direct or indirect, but whether there is enough business developed to make it advisable is a serious problem.

As a general proposition, that advertising which is most direct pays the highest return, while the general advertising is much less profitable, the ratio of results being governed by the proportion of the general reading public that is interested in the article advertised.

It is probable that the most profitable results would not be secured by advertising clayworking machinery and appliances in the literary magazines of to-day, because of the small per cent. of readers who would be interested in the machines so advertised in proportion to the amount charged for the advertising. In the same way every bit of advertising must be considered from the result-producing standpoint, and from this point alone must be judged as a good or poor investment.

This brings forward a question which the members of this association might carefully consider with profit to themselves. It has been the custom for some years for the machine men to give away souvenirs at the conventions. This is unquestionably good advertising, but whether the results are worth the increasing cost is an entirely different matter.

Convention souvenirs may act as a detraction from the subject matter under discussion at the sessions and lead the attendants to neglect the sessions for the booths and headquarters where souvenirs are dispensed. Whether or not it would be better to cut out the souvenirs is a matter which might be discussed by the Manufacturers' Association, but if it will result in the general good of the clay manufacturer it should be done.

Advertising an Ancient Art.

Advertising is not a new thing. Away back in the Garden of Eden we find it. Eve advertised the excellence of the apple to Adam—and he bit.

Millions of people have been biting at good advertising ever since. That bit of advertising on the part of Eve is reputed to have changed the entire social, moral and religious complexion of the world.

Note what a power there is in a bit of advertising. Note, too, that Adam and Eve advertised to their friends and neighbors that it was really the fault of the serpent, and down the cycles of time, to the present day, there has come an almost universal effort to get even with the snake, and every heel is raised against this humble member of the invertebrate family, though it is really most useful.

We find again the power of advertising in the much heralded and widely advertised flood as put on by Noah. At that time there were few believers in advertising, but the fellows who had the faith bought passage on the ark and lived to say, "I told you so," and to extol the merits of the scenic route, the skipper and his crew; while the others who failed to read the papers, or looked upon the advertised flood as a fake on the part of the yellow journals, went into "liquidation" and were never heard of again. This ought to prove to you that you should advertise, whether the other fellows believe it or not. Also that you ought to believe what you see advertised. We don't have such floods nowadays, but we do get submerged occasionally by panics, and when you see it advertised that a prosperity special has been chartered to carry everyone to affluence, you mustn't sit around in your tent at the foot of Mount Ararat and sulk. "Come out of it." Get aboard. Shovel a little coal under the boiler and get up some additional steam. Grease the axles with a bit of cash and push the special on with a little faith, toward a speedy voyage.

Trade Papers Entitled to Patronage.

Not long ago the American Clay Machinery Company received the prospectus of an eastern association of manufacturers who had a big idea. It was to save expense to the members of their association. One of the big talking points of the circular was that they would save at least half of the advertising expense because each member would agree to cut off a half of his advertising. That idea looked good on paper from a saving point of view, but was it practical?

Could we cut off a half of our advertising without ourselves being the sufferers?

The trade papers are built on a basis of their receipts. Suppose we withdrew from our papers a half of their income by cutting off a half of their advertising. Wouldn't that make it necessary for the managers of the papers to make a cut in the quantity and quality of those publications?

Could a paper be made as interesting under such a cut, and would the subscribers continue to take a paper which showed such necessarily apparent retrogression?

It is the circulation we are interested in, nothing more and nothing less. We want our advertising to reach the largest possible number of interested readers, and, in withdrawing our support from the trade papers, we would only be cutting off the result to be attained from our advertising

The trade papers are entitled to a reasonable amount of patronage because they represent us before the trade and we should have a sense of pride in a creditable representation. Possibly we do not need four or eight pages each issue, but we should give them a steady income of a fixed number of pages a year so that they may know what to expect and cut their cloth accordingly. It would be better to be over loyal in our support rather than to be too parsimonious.

Before coming to this convention it was my pleasure to look over the convention numbers of our trade papers, and I was imbued with a feeling of pride not alone for the papers themselves and the advertisers, but for the trade which makes such excellent editions possible.

Clay Trade Practically in Infancy.

The clay trade is practically in its infancy. In the past 25 years there has been no development equal to it excepting in electricity. That development will continue, if it is properly pushed, because of the growing scarcity of wood for building purposes and the growing horror of our fire record. Neither the available timber supply nor the supply of cash in this country will permit of the people of the United States burning up $600,000,000 worth of buildings a year as has ben done in the past. The country must and will look for a more nearly fireproof construction. That can best be attained through the use of the very best material for the purpose—burned clay products. But the builders and the public and not the clay trade will draft the specifications. There will be two competitors for public favor. One will be clay and the other cement. Already the battle is on and it is up to the clay interests to see that burned clay takes the position and receives the recognition to which it is entitled.

Here is an opportunity for good advertising open to the Machinery Association, in which they should combine with the clayworkers and other kindred interests in promoting to the utmost of their ability the merits of burned-clay products. The cement organization of the country has some of the most able advertising men engaged in a campaign for the promotion of cement. Hundreds of thousands of dollars are being spent in the cement campaign, and much of the advertising works to the detriment of clay products.

The general public is led to believe that cement is a "cure-all" and that it surpasses every other material for every class of building and every kind of construction.

There is a large and useful field for cement, even though it is confined to the construction and uses for which it is superior, but there is an increasing tendency for cement to overlap the field of burned-clay products and it is of vital importance that the clay-manufacturing interests keep cement in its proper field. This can only be done by judicious and persistent advertising. A few thousand dollars for this campaign would only be a drop, as such a campaign as is required will cost many thousands of dollars and the longer it is delayed the more it will cost.

While the public learns dearly in every concrete failure, yet they do not know that concrete should not have been used at all and that brick would have prevented the failure.

The movement of the National Brick Manufacturers' Association toward an advertising campaign of this kind is a good beginning, but should be backed up by generous subscriptions from every interest dependent upon the clay trade for business.

Our trade papers are doing even more than their share in this campaign, but they are preaching to pews filled with those who are already of the faith.

Burned-clay products will never occupy the position to which they are entitled until a united and vigorous campaign of education is carried out. It is true clay plants will continue to be operated, but the volume of business will be many times as great when the careless thoughtless and indifferent public is made to understand that, as a building material, burned-clay products rule supreme, that they are in most cases without an equal and in every case without a superior.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

30. Wire, tiles, etc.—A London firm wishes to get into touch with Canadian importers of wire, glazed wall tiles, enamel ware, picture mouldings, etc.

32. Representative.—A correspondent in Belgium wishes to get into touch with Canadian engineers and merchants who might require the services of an inspecting engineer or buying agent on the Continent.

44. Cement bags.—A wholesale cement merchant with established offices in London, Glasgow and Leeds, invites samples from Canadian manufacturers of damp-proof bags to hold 112 or more pounds of cement.

52. Slate.—The owners of a slate quarry in Cumberland desire to be introduced to users and importers in Canada of green slate, claimed to be of superior color, fineness and durability.

Sewage Disposal Publications

To the Editor of the "Contract Record":

I have just read with interest Mr. T. Aird Murray's criticism, entitled "A Peculiar Septic Tank Sewage System," and would like to know where I can procure copies of the "Royal Commission Report" and "Hamburg Experiments." Sewage disposal is a subject upon which it seems very hard to get satisfactory information. After reading the article by Mr. L. B. Kahn, and then turning to Mr. Murray's, one is as far at sea as ever. If you will publish the names and addresses of where the above reports can be secured it will be acceptable to many of us who are trying to get reliable information along these lines.

W. ELWOOD POLLOCK,
Architect, New Liskeard, Ont.

The Fifth Report of the Royal Commission on Sewage Disposal, 1908, is published by Wyman & Sons, Limited, 109 Fetter Lane, London, Eng. "The Hamburg Experiments" are published under translation, "Principles of Sewage Treatment," by Professor Dunbar, of the Hamburg State Institute of Hygiene. Copies of the latter work may be obtained from Griffin & Company, Exeter street, Strand, London, Eng.

The Georgian Bay Engineering Works, Midland, Ontario, have issued an interesting catalogue of their hoisting machinery. The catalogue is published in an attractive manner and contains a large amount of interesting information for users of this class of machinery. It is extensively illustrated with pictures which convey an excellent idea of the value of these machines. This is the fourth edition of the company's catalogue of hoisting machinery and it contains illustrations of several engines which did not appear in the former editions. The Georgian Bay Machinery Company has established a reputation for manufacturing substantial and practical machinery and its designs have met with the approval of many of the largest users in the country.

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Heat Regulation and Control

The first thing to be done in our homes to bring about a better condition, no matter how they are heated, is to stop overheating our living and bedrooms, says E. D. Sidman, in "Building Management." Therefore a thermometer is almost as essential as the heating apparatus itself. Where stove heat is used this will require some personal attention and care, but the result will amply repay it. With furnace, hot water or steam heat, in all cases a thermostat should be used, and under ordinary conditions the temperature in the living rooms should never be above 72 degrees F. If the directions regarding humidity are carried out, it will be found that a temperature of from 65 to 68 degrees is entirely satisfactory for comfort, and a considerable saving in the cial bill.

The next step is to always have the humidity in our homes as near normal or outdoor conditions as possible; to determine this, each home should have a hygrometer, or, preferably, a hygrodeik, as they are more reliable and easier understood, and use it. In stove heated rooms use the old-fashioned but serviceable open pot, pail or can filled with water and set on the stoves. On the ordinary base burner you can have an ornamental can made to set in between the stove and pipe if desired, or on the stove pipe of any stove can be fitted a round humidigiver with a perforated top. Keep these filled with water, and use enough of them till your hygrodeik shows from 60 to 65 degrees of humidity.

Automatic Humidifiers Recommended.

If your home is heated by a hot air furnace and you are the owner, equip your furnace with an automatic humidifier of the right size, and your proper degree of humidity is assured. If you are a tenant, and your landlord will not go to the slight expense to put you in a humidigiver, keep the water pan in your furnace full of water, and hang a small bucket or can full of water under each register, and keep them full of water, till your hygrodeik shows you the proper amount to use for best results. Meanwhile it would be a good idea to look up other apartments having a more liberal or humane landlord. Where your home is heated by either steam or hot water, and whether you are owner or tenant, equip your indirects (unless you use washed air) with a perforated pan humidigiver, which is not expensive, and is so made that while it will furnish a large volume of moisture to the air, it will not interfere with the heat. In connection with the indirects, or in homes where there are no indirects, use a sufficient number of either shield or knapsack humidigivers to get proper results, the shield form being preferred, as it is more tasty and ornamental and prevents the discoloring of walls and curtains caused by hot water and steam.

Last, but first in importance, comes ventilation. All ventilation must begin by removing the foul air. Homes with fireplaces, whether built solely for ornament or for use, have in each a first-class exhaust vent if properly used, especially so where several rooms open into that containing the fireplace. If the fireplace was built for ornament, the top of the flue should be capped with a non-down draft vent head; then in homes heated by stoves or hot air, a light fire of paper or shavings, built in the fireplace or flue, will start the draft upward, and the exhaust vent is completed, and will do fairly good work, though care must be taken to repeat this operation every time the house has been allowed to get cold. Much better results can be obtained where the fireplace can be used, as a light coal fire or the heat from a gas log creates a strong updraft. In homes heated by steam or hot water a positive updraft can be maintained in the fireplace by running an aspirating pipe up the flue; properly run so, it will circulate.

The living rooms in homes built without vent flues and heated by stoves will have to depend on window ventilators and the fireplace for fresh air and ventilation, and, where there is no fireplace, on the ventilators alone. Where possible place the window vents so as to get cross circulation, by putting a small vent in two windows placed opposite or at an angle to each other in each room, which will furnish sufficient air; if this is not possible, there should be two vents of a larger size distributed in two windows as far apart as possible. This method of ventilation is more expensive in fuel than where you can use aspirating vent flues, but will be found worth the price in health and general comfort in the long run.

Special Vent Flues.

In homes heated by hot air, in addition to the fireplace, even if there is one, build more or large flues at the baseboard of the lower floor (in a cottage heated by hot air the same method of ventilation will have to be used as in a stove heated house). A proper number of vent flues can be made by utilizing the space between the studding next to the hot air pipes running to the upper floors, letting these pipes furnish the heat to create the updraft, by boring a few small holes through, or by cutting away a piece of the plates. These flues can be extended from floor to floor into the attic, where they can be bunched into one, or be carried singly through the roof by means of tin or iron pipes, in all cases putting a non-down draft vent head on the top. Put in suitable sized registers in the baseboards, and your foul air vent flues are complete. The flue formed by the space between the studding and lathed and plastered both sides, is practically air tight. The writer has used and seen vent flues made as above used with success for years, though the first time he was obliged to utilize this space for a vent flue, which was in an old hospital a number of years ago, he was really more surprised at the results than the mechanics that built them and had ridiculed the idea.

One bedroom at least should have an exhaust vent for cases of sickness. When the above exhaust vent flues are completed and working it will be found that the fresh air intake to the furnace can be run outside of the house for its supply, and that the air currents will not change, no matter from what direction the wind blows, but if this change should not be convenient to make, or be too expensive, a window ventilator in each room will furnish an abundance of fresh air.

In homes heated with steam or hot water, the above scheme for foul air vents can be used with an even better degree of success than with hot air, by running an aspirating pipe to near the top of each vent, run so that it will circulate. If there are indirects, or direct-indirects, in the house, a good supply of fresh air can be brought in through them, and if the house is so arranged that a number of rooms are open into each other, they may furnish all the fresh air necessary when stimulated to circulate by the foul air vents; if they do not furnish enough fresh air, or there are no indirects, window ventilators should be used.

Furnace Dimensions

Every furnaceman should determine independent of the manufacturer's rating the size furnace required to warm a house containing a certain equivalent cubic feet, says an exchange. The writer in question said that by measuring and determining the degree of heat of flue gases and by actual test, that 8,000 heat units is the average amount of heat that can be made available from the combustion of one pound of coal. We learn from another source that 13,000 heat units are the product of one pound of coal, and that 60 to 70 per cent. of this is available for heating. This supports the above statement, and means that for every pound of coal burned we may calculate that 8,000 heat units are transmitted to the air chamber of the furnace.

The writer quoted further says a conservative deduction is that the amount of heat that the air will absorb from the fire and the products of combustion will be 8,000 heat units for each one pound of coal burned.

Experience has shown that a fire burning at the rate of five pounds of coal per square foot of grate surface per hour will give excellent results and will not require too frequent attention. This leads to the conclusion that a conservative rating on the heat unit basis, regardless of special construction or other details, would be 40,000 heat units per square foot of grate surface per hour. This comprehensive line of reasoning leads to the conclusion that the rule will produce a good estimate for the poorer furnaces of accepted types and a conservative estimate for the efficient types, and this rule means that we shall first determine the heat losses from walls and windows as explained, and then multiply the sum total (the equivalent cubic feet) by the ratio of the difference between the temperature of air leaving registers and external air to the difference between the temperature of air leaving registers and the temperature of air of the rooms, divide the product by 40,000 and the result will be the required grate surface in square feet.

The required temperature at the registers is 140 degrees.

In the rooms 70 degrees, but the temperature used for external air should be the lowest experienced in the particular locality where the furnace is to be installed.

Vancouver Builder's Enquiry

To the Editor of the "Contract Record":

I have just read the article entitled, "An Up-to-date Plumbing System," recently published in the Plumbing and Heating Department of the "Contract Record." While there are a number of good points in this article, it seems to be that the system illustrated hardly justifies the title. There is at least one trap, that on the lavatory waste, which should be vented, otherwise the seal would be apt to be broken by syphonage. The statement that galvanized pipe, used for waste, is good for only two years, is misleading unless sheet iron pipe is used, and I have known this to last much longer. I would like to see some other criticisms of this article. I am not a plumber, but just—

A BUILDER.

A Plea for Furnace Heating

To the Editor of the "Contract Record":

Warm air furnace heating has to a great extent been discredited in popular estimation as a method for heating first-class residences. This has been due to defective installation and a desire for cheapness. Some of the furnace manufacturers seem to have no desire to elevate furnace work. Those who are conversant with this branch of work,, cannot but agree that there has been a general dragging down of the furnace heating system, both as to the knowledge of it to produce good results. and the price for it to render a profit. It seems too bad that some manufacturers in this city care little how their furnaces are installed. Their whole desire is to sell their furnaces regardless of how they are placed for the amount of tonnage sold.

The warm air system of heating is the best sanitary method for the following reasons: First, that it is the most sanitary and healthful; second, that it is more easily regulated and controlled; third, that it is fully as economical as any other system in consumption of fuel; fourth, that it costs less for repairs and maintenance; fifth, that it is the only method that will give ventilation, which is so essential in every house. There is no better system of heating than a correctly proportioned and properly installed warm air plant. It is to be hoped that something will be done by manufacturers and dealers to uplift warm air furnace heating. There are many so-called furnace men who have no other recommendation than low price as long as the job is accepted and bill paid.

It is satisfactory to note that the manufacturers and dealers in the United States are forming what is called the Federal Furnace League, an association organized to uplift and advance the warm air furnace system of heating. I trust that this movement will find its way over to our side of the line.

W. A. H., Toronto.

The strength of the joints is an important element in the success of a job of plumbing. This strength depends, not only upon the quantity of solder used, but more particularly on its quality. Too long manipulation spoils the solder and weakens the lead. The first joint made, if the metals are thoroughly fused, will be the most reliable, even if the shape is not absolutely perfect.

In making wiped joints, the metals to be joined should be heated to a temperature nearly equal to the fusing point of the solder. Care should be taken that they are not heated beyond this temperature. The ends of the pipes should be fitted tightly to prevent the solder from entering the interior. Wiped joints, properly made, are the strongest known to the trade and the plumber who can make them correctly may fairly be considered as a master of his trade.

The B. Greening Wire Company, Limited, Hamilton and Montreal, are installing electric welding machinery in their works for the more economical welding of the iron frames for their wire door mats, wire guards, tellers' cages, etc., also for wire chain fittings, and the welding of wire generally.

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

Concrete in Municipal Work

One of the most interesting addresses given at the convention of the Canadian Cement and Concrete Association was that by Mr. A. W. Campbell, Deputy Minister of Public Works for Ontario, upon "The Use of Concrete in Municipal Work." Mr. Campbell said:

Concrete by reason of its strength, its durability, its plasticity and cheapness, fills a most important place in municipal construction. Its use, which now covers a wide field, has grown up within the past quarter of a century. During this time its characteristics have become better known. Its uses and limitations have been extended and defined; its manipulation is better understood; the quality of cement has been improved; its cost lessened, and the cost of mixing has been reduced. General confidence in its strength and durability has been created, and its place as a material of construction has been unquestionably fixed.

While the use of concrete has grown up within the past quarter of a century, the use of Canadian cements, it is interesting to note, has been established within a much less period. Fifteen years ago or less, conservative engineers would endorse only English and German cements. I learned from the last report of the Ontario Bureau of Mines that in 1891 there was manufactured in Canada 46,174 barrels of natural rock cement, valued at $39,419; and 2,033 barrels of Portland cement, valued at $5,082. In 1907, there was manufactured 7,239 barrels of rock cement, valued at $5,097, and 1,853,692 barrels of Portland cement, valued at $2,777,478. The total product in 1891 was valued at $44,501; in 1907, at $2,782,575. To-day there are in operation in Ontario some sixteen factories. In 1891 the valued cost per barrel of Canadian Portland cement was $2.50. In 1907, the valued cost at the factory was $1.50.

This wonderful growth of the cement industry is by no means to be attributed wholly to municipal uses, but certainly municipal construction will account for a good proportion, in concrete sidewalks, concrete bridges and culverts, concrete tile, concrete sewers, concrete foundations for pavements, and various other uses.

In this article it is not my purpose to discuss the quality of cement; the processes of mixing; relative merits of wet and dry concrete, and of gravel and stone; the method of depositing concrete; the quality or cleanness of sand and of the aggregate, nor details of design. All these are essential, and in anything favorable which may be said with regard to concrete, it must be understood that reference is made solely to good concrete reinforced with steel where necessary or economical, and to work of skilled design. Unfortunately, we in Canada are handicapped greatly by clumsiness in the manipulation of concrete, more so than in England, where workmen are more skilled and better trained. Inferiority of workmanship prevents largely our use of lighter forms of reinforced concrete, where allowance cannot be made for defective workmanship.

The important and growing use of concrete is in the construction of bridges. Concrete can ordinarily compare with steel superstructure in point of cost, up to 40' and 50 feet in span, while arches have been built in the province exceeding 100 feet. The necessary requirement of concrete arches is a firm and unyielding foundation, and at this point the advantage of steel superstructure makes itself apparent.

While the large bridges excite our admiration, yet it is with the commoner bridges, everywhere spanning the small streams and rivulets on the King's highway, that municipal councils have most to do. A bridge is an important part of a landscape. It may, in its design and construction, harmonize with nature, or may lend a discordant note to a scene of beauty. Very little consideration has been given to the artistic side of bridge construction by the municipal authorities having charge of the erection of bridges. It is taken for granted that questions of cost, economy, and utility are of too pressing a character in this new country, to permit of the ornamental. It is fortunate, therefore, that good design and good construction possess in themselves the chief elements of beauty, so that the results have been, on the whole, fairly harmonious. Nothing will accord with the ordinary landscape more perfectly than a well built arch of concrete, however simple in design. Much could be gained if more attention were paid to the appearance of these structures, but it is very easy to run to the opposite extreme with tawdry results. It is a short step from the ornamental to what is merely ornamented—the latter a very unsatisfactory substitute for simplicity suitable to country bridges.

In building bridges of steel and concrete, it should be remembered that they will last for years, and their appearance is therefore a matter deserving much consideration. Concrete is a material which lends itself to easy manipulation, and much can be done by moulding it into graceful outlines. In doing this there need be no attempt at imitating other materials. Fussy ornamentation should be avoided. Concrete lends itself to distinctive and original treatment in the direction of panelings, mouldings, and graceful outlines, based on proper methods of construction.

In durable and well-built bridges there is an opportunity for work of a monumental nature, that should not be lost. Permanent bridges now being erected may be made enduring structures of good architectural type, such as will be creditable to their builders for centuries. Concrete has endured through the ages, and no better was ever manufactured than that which is now being made. It is for councils to see that the design and workmanship are as reliable as the materials they are using. Materials of a temporary nature may be made to answer temporary needs. But materials of a durable and permanent character should be so used that posterity will admire them.

In no department of municipal work has concrete made itself more effective than in the construction of sidewalks It is only about twenty years since the first walk of concrete in the city of Toronto was laid on King street, near the corner of York street. It is still in use, with little sign of wear for its age, despite the heavy traffic of that district. Concrete walks are durable, cheap and of good appearance. That many miles of these have replaced the old plank walks, so constantly out of repair, dangerously so, is a matter for congratulation. The dissatisfaction with concrete walks is that they are extremely hard, lacking in the resonancy of tar walks, asphalt walks, or even plank. Experience with them has tended to overcome in part their slipperiness by suitable treatment of the surface, and has greatly reduced their cost. Failure of these walks has been largely due to a tendency of expansion joints; to lack of bond between the base and the surface coating, and to a careless surface finish. One decided step towards cheapening the cost of concrete walks has been made by doing away with the great mass of stone or gravel foundation formerly used. It has been found that on well-drained sand or gravel or other porous soils, this foundation is wholly without use. In clay, these excavations merely become a receptacle to hold water, if drainage is not perfect.

Public buildings, municipal in character, such as town and city halls, public libraries, waterworks and electric stations, afford a very satisfactory field for the use of concrete in its artistic forms, or where fireproof construction is required. In recent years numerous buildings of a classic type have been erected for which concrete is exceedingly serviceable, and very pleasing and successful results have been secured.

The idea of concrete pavements has been carried out to some extent for a considerable period, but any extended use in this department has not yet been made. Lack of experience is possibly one explanation, deduced on the belief that pavements of this material would offer a very insecure foothold for horses, that it would be almost useless for this reason on grades, and that surface repairs would be to a certain extent difficult. Their use has indicated a tendency to wear and break away at the joints. A concrete pavement is, however, cheap and is of good appearance, and time may create a more satisfactory belief in its usefulness in this regard. Concrete curbs and gutters have been largely used and their value at this stage requires no endorsation. Their durability and good appearance entitle them to a first place for this work, and the low price for which they can be built will extend their use to the smaller towns and municipalities; in this way, playing a most important part in street improvement.

Concrete for pavement foundations has made sheet asphalt possible—our finest pavement for city streets. Concrete foundations are also indispensable for asphalt block, vitrified brick, and the higher class of city pavements. As a material in city pavement construction, it has been one of the most important of modern improvements.

Concrete tile for small culverts on country highways have now almost wholly displaced timber and other material. For suitable situations and when properly laid, they are cheap and permanent. There is, however, a tendency to use them when a larger waterway is necessary to accommodate the maximum flow. For it is the maximum flow for which provision has to be made—such a flow as occurs only in a period of years. Very frequently too, the pipes are made too thin; are badly laid, and have insufficient covering over them. As pointed out, however, where concrete tile are found sufficient to accommodate the flow, and are treated firmly in other respects, they are durable and cheap.

For large sewers, concrete is found to be cheaper than brick. Experience will, however, no doubt fix more definitely its place in this regard. At the present time, there is a tendency to believe that it will not resist the action of acids finding their way into the sewers from manufacturing shops. A combination of brick with a concrete lining, offers a solution of this difficulty.

Concrete floors for steel bridges afford an important use for this material. Concrete floors are necessary for the best class of work. Timber floors require constant repairs and renewals; are expensive and at times lead to accident. Concrete floors require heavier steel work. Heavy live loads to which bridges are now being subjected are also demanding a heavier and stronger class of work. Concrete floors bind a bridge into one homogeneous structure, and distribute the weight much more perfectly than timber can do, so that with a concrete floor the strain on the bridge is much less. They are better adapted to traffic, in that horses can trot over them, and the speed does not subject the bridge to unusual strain.

In retaining walls, concrete is extremely useful. By careful design, with well disposed reinforcement, concrete can be made much cheaper than stone masonry. The appearance is equally pleasing and the durability with well made concrete is no doubt greater.

There are numerous other minor uses. Concrete can be used for the foundations of buildings, for foundations for heavy machinery in waterworks and electric stations; for septic tanks; subways, tunnels of various kinds; piers, etc. While the durability of concrete, reinforced and plain, has been settled beyond any reasonable doubt, and a definite place assigned to it, yet new uses are constantly arising, and its field is being steadily extended. Time is throwing new light upon its action under various conditions, and we are gaining experience which tends greatly to emphasize the value of concrete as a building material.

Annual Meeting Good Roads Association

The Ontario Good Roads Association held a highly successful annual meeting in the York County Council Chamber last week. His Worship the Mayor of Toronto and Hon. Dr. Reaume, Minister of Public Works for Ontario, were the principal speakers at the opening of the meeting. Mayor Oliver, in his address, said:

"It has often occurred to me that some arrangement might well be entered into between the Government of the province, the municipalities, and the county authorities, whereby the various roads leading from a municipality might be properly constructed and kept in a state of repair for the distance of some ten or fifteen miles from such municipality. The tax at present levied by the Provincial Government on automobiles might very properly be used for good road purposes."

Hon. Dr. Reaume spoke largely on what the Government had already done along the line of good roads, and intimated that any proposals the association might make would be listened to with favor, as it was representative of the whole province. The Government was ready to give dollar for dollar with the municipalities in building leading roads, and in the case of new townships even two dollars for a dollar would be given.' He paid a compliment to the Good Roads Association, and said that they were most valuable to the Government, as it was through them that most information about the existing conditions was gathered.

Mr. L. H. Clark, former president of the Toronto Board of Trade, made a brief speech on behalf of that body.

A number of very interesting papers were read, including the following: "Boulder Stones in Southern Ontario—Their Road-making Qualities," by Andrew F. McCallum and T. Aird Murray; "Winter Roads—How to Keep Them Open and Serviceable," John M. Young, ex-Warden of Wellington, of Harriston; "Earth Roads—Their Improvement and Maintenance," W. B. Rittenhouse, Beamsville, and J. Young, of Abingdon.

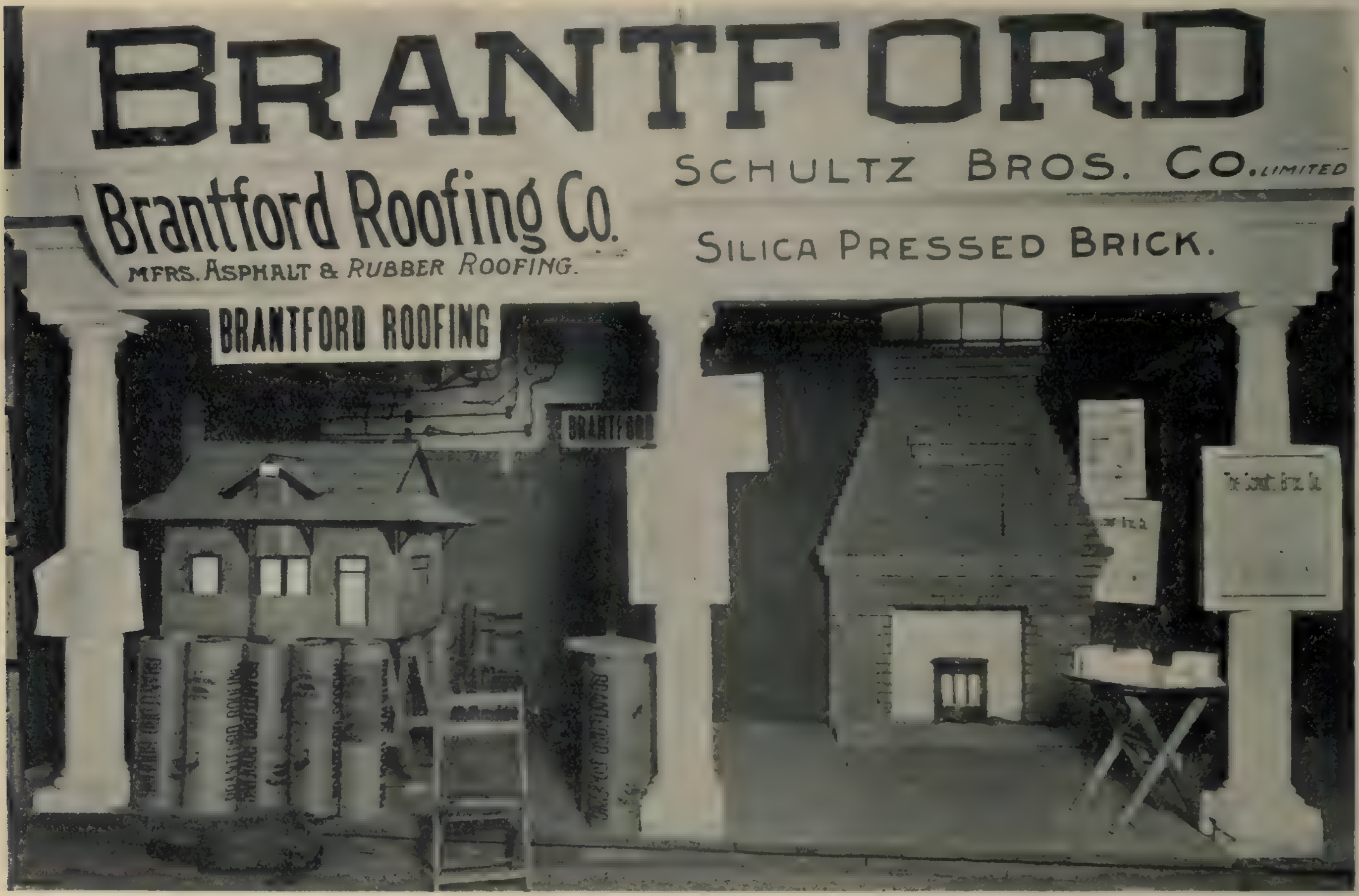
The election of officers resulted as follows: President, Wm. Pugsley, Newmarket; Vice-Presidents, the Wardens of the Provincial County Councils; Secretary, J. E. Farewell, Whitby; Assistant Secretary, W. A. McLean. The executive committee will be composed of the above officers and R. H. Jupp, of Simcoe, and J. L. Taylor, of Wentworth.

The auditors' report showed a credit balance of $233.

The following resolution was moved during the meeting by Mr. J. F. Beam, of Welland, and was adopted:

"Whereas, the province has, with a lavish hand, aided our privately owned railways which provide the long haul to market for our farm products:

"Resolved, That the province now provide more liberal aid for the equally important short haul of the same products from the farm to the railway station over our publicly owned highways by increasing the present grant from one-third to one-half the cost for good roads under county system."



Brantford Roofing Company's Excellent Exhibit at Recent Cement Show

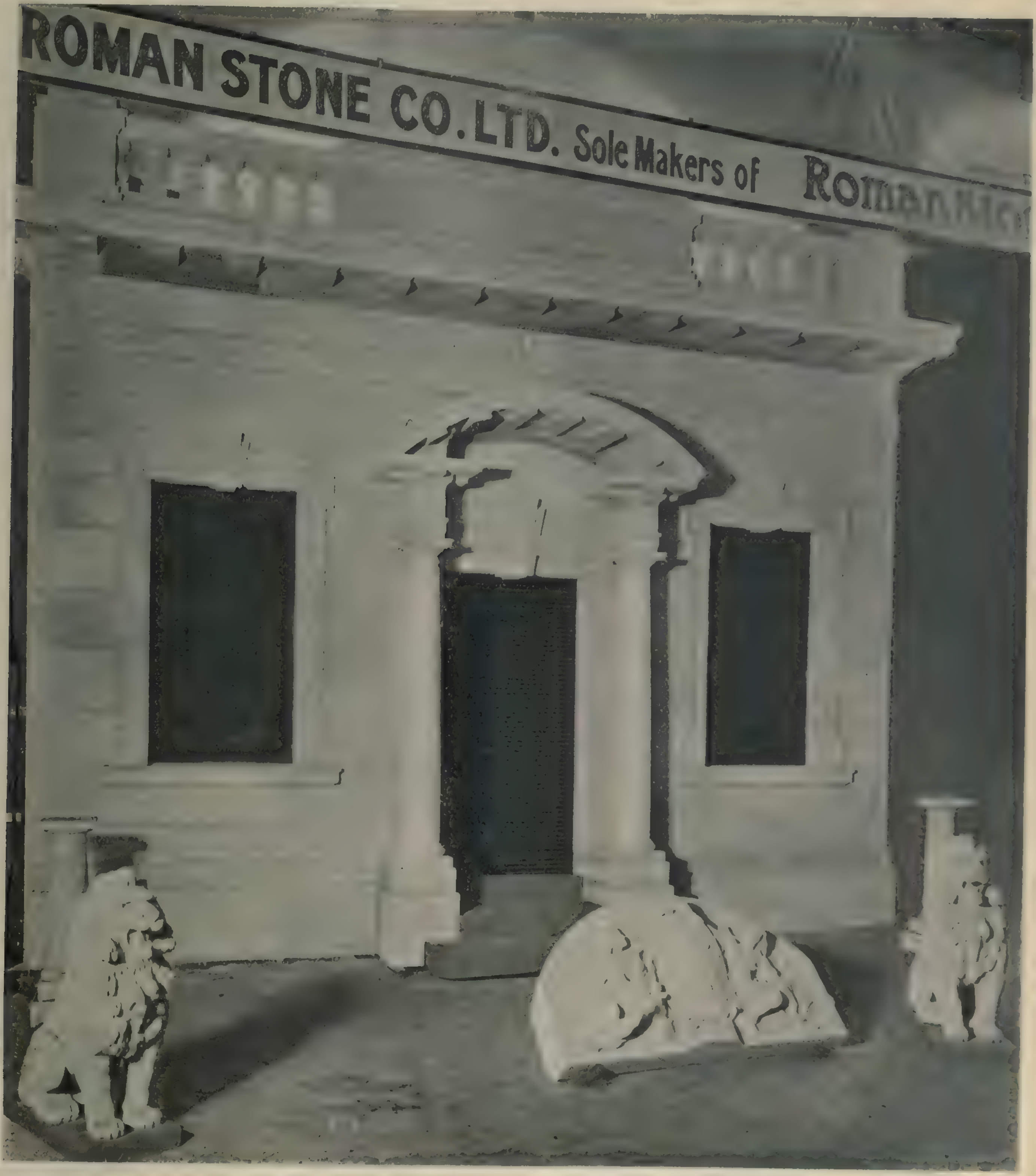
Reinforcing Concrete and Bricks

A type of construction that is attracting some attention abroad is described in a pamphlet issued by Messrs. Johnson, Clapham & Morris, of London, in illustration of a system of wire mesh bonding for brick walls and for bonding brickwork to reinforced concrete piers. There is shown the plan of a pier and part of the wall of a powerhouse forty feet high, with the walls of only nine-inch brickwork strengthened and tied by wire bond in the brickwork and between brickwork and concrete piers. It is stated that this wall has successfully withstood the test of the pulsations of large gas engines. In commenting on the system the London "Builder" makes the following statements:

It is claimed that with this system brick-on-edge partitions can be securely erected. It is certainly worth attention, though, as already remarked in a previous notice, it is not "monolithic brickwork," and the title is a misnomer, and should be altered to "reinforced brickwork," which would be the correct description. In regard to the facility which it presents for building cavity walls without using a large amount of material or running to an inconvenient thickness of wall, that is unquestionable; but our opinion has always been against cavity walls, as we think it undesirable to have in any building hollow spaces which are permanently inaccessible, and where it is impossible to know what may be going on. That is a matter, of course, on which there are differences of opinion; hollow walls have their advantages; but on the whole we are against their use. But the system of reinforced brickwork and the manner of bonding it to reinforced concrete, may prove an important means of obtaining strength in brick walls with a minimum of thickness.

A bill has been introduced in the British Columbia Legislature to amend the Mechanics' Lien Act by striking out the subsection relating to the time for giving notice of lien and inserting the following in its place: "No lien shall be had or claimed for materials unless notice in writing shall have been given to the owner or his agent of the intention to claim a lien for such materials by the person claiming the lien at least fifteen days after the completion of the work, building or erection."

Roman Stone Company's Exhibit at the Cement Show



Attractive Display of Roman Stone Company at Cement Exhibition.

The accompanying illustration gives a fair idea of the excellent exhibit of the Roman Stone Company at the recent Canadian Cement & Concrete Association in Toronto. It was a representation of a small bank front which showed off the company's stone to splendid advantage, as this is a class of work for which it is particularly well adapted. The lions shown in the foreground were carved out of Roman stone, as was also the coat-of-arms for the Bank of Montreal. These were excellent examples of the stone-cutter's art.

Publications and Calendars

The General Fireproofing Company, Youngstown, Ohio, have issued an attractive booklet descriptive of their bar, mesh and fabric reinforcement.

Thomas H. Dallett Company, Philadelphia, have issued a catalogue (No. 100) relating to their air compressors. The catalogue is extensively illustrated and contains a large quantity of useful information.

The Raymond system of concrete piling, which provides a shell or form for every pile, is attractively described and illustrated in a booklet which has been published by the Raymond Concrete Piling Company, 135 Adams street, Chicago.

The Wellman-Seaver-Morgan Company, engineers and manufacturers, Cleveland, Ohio, have published an illustrated bulletin descriptive of their automatic buckets for handling iron ore, anthracite coal, bituminous coal, crushed limestone, blast furnace cinder, sand and similar materials.

The Vulcan Portland Cement Company, Limited, have published an interesting little book, entitled, "Portland Cement Sidewalk Construction." The common mistakes met with in this class of work are treated in an intelligent and interesting manner. The illustrations also are particularly good. A copy of this work should be in the hands of every municipal engineer, architect and contractor. Copies may be obtained on application to the William G. Hartranft Cement Company, Limited, Montreal, Que., the sole Canadian selling agents.

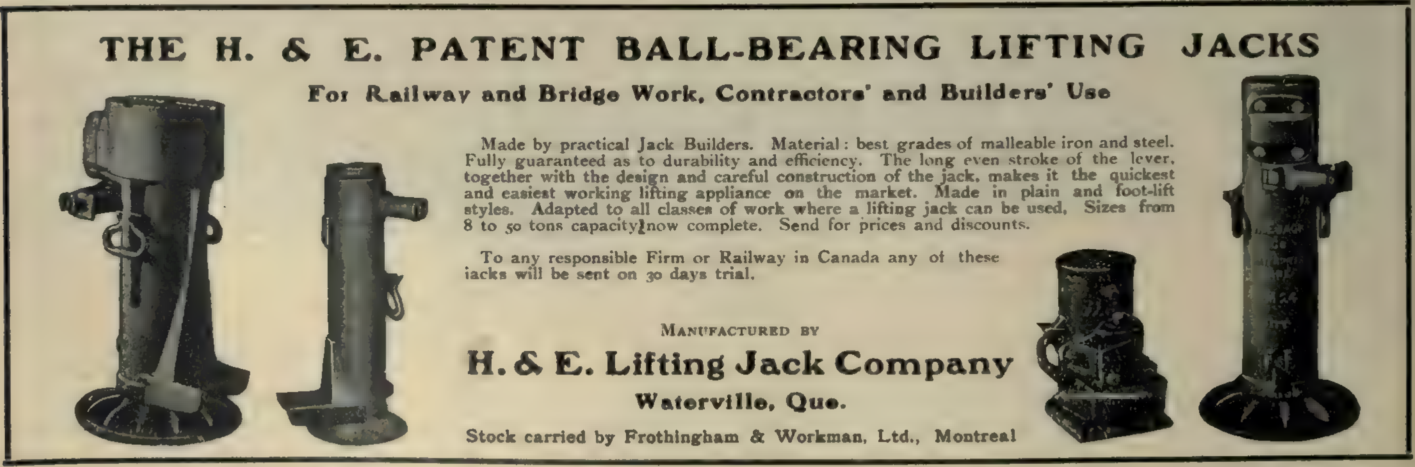
"Aid to Shippers" is the title of a 72-page book containing a quantity of information of value to all engaged in the export or import trade. The book is issued by Oelrichs & Company, of New York, for more than forty years the American representatives of the North German Lloyd Steamship Company. The table of foreign moneys with United States equivalents, together with weights, measurements, tariffs, customs requirements, etc., will be found of great value. "Aids to Shippers" will be sent, postpaid, on request to Oelrichs & Company, Forwarding Department, 5 Greenwich St., New York.

The Ambursen Hydraulic Construction Company of Canada, Limited, with offices at 519 Coristine Building, Montreal, inform us that the War Department of the United States Government at Washington have given their official approval of an Ambursen dam 60 feet high in the rollway, 80 feet high in the bulkheads, and of a total length of about 1,000 feet. This dam is to be installed on the Savannah River, and is to support a flood of 300,000 second feet such as occurred last summer (as great as the total flow over Niagara Falls), which will mean a depth on the rollway of about 16 feet. The United States Government has also approved of the Ambursen dam for the United States Reclamation Service, and built one situated on the Shoshone River, about eight miles below Cody, Wyo. The foundations are on gravel and shale and the dam proper is 400 feet long by about 50 feet high, supported by a floor two feet thick.

Allis-Chalmers-Bullock, Limited, Montreal, have favored the "Contract Record" with a copy of their 1909 calendar, which is one of the most attractive calendars that have reached us. It is handsomely designed in a rich deep brown color and contains a large calendar block, making it serviceable for office use. It is decorated with a cleverly conceived and well executed picture in colors entitled "The First Engineers." The picture portrays several beavers felling trees and piloting logs across stream for the purpose of building a dam. Allis-Chalmers-Bullock, Limited, manufacture all kinds of hydro-electric power machinery as well as electric motors, transformers, dynamos, switchboards, steam turbines, gas engines, Corliss engines, water wheels, mining, crushing, cement, flour mill and sawmill machinery, hoisting engines, turbine pumps, etc. The painting on the calendar is from the brush of Mr. Arthur H. Hider, a well known Canadian artist and was designed especially for Allis-Chalmers-Bullock, Limited.

Proper Plans Needed for Plumbing Alterations

In making extensive plumbing alterations it is wise to have a comprehensive plan prepared before letting the contract. The advantage of having well-prepared plumbing plans and specifications are seven-fold, says a competent engineer on this subject. There are many men of financial responsibility engaged in the plumbing business who do not possess sufficient skill and knowledge to properly lay out a system, and, unless the plans are full and complete and the specifications explicit these men cannot intelligently estimate on the work; consequently, they will either refuse to figure the cost or will estimate so high as to be out of the contest. If, on the other hand, the plans and specifications are so well prepared that nothing is left to conjecture which can be shown, described or explained, the architect and owner will have the benefit of responsible competition and will secure a better installation.



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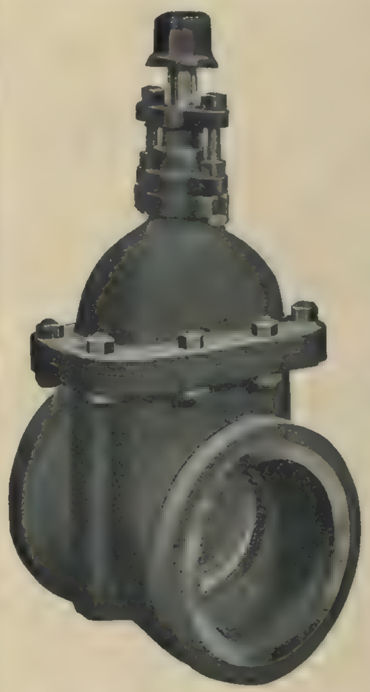

Towns and Cities

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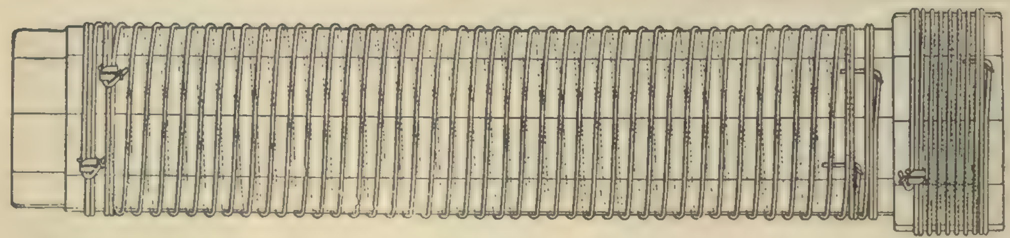

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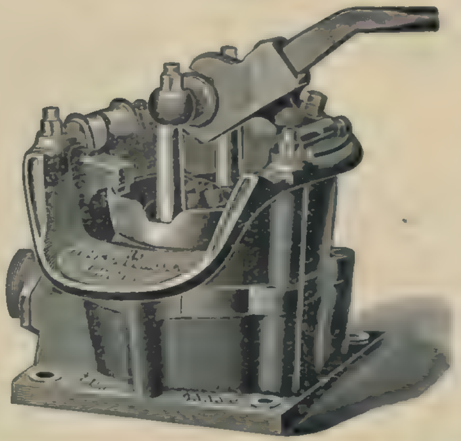

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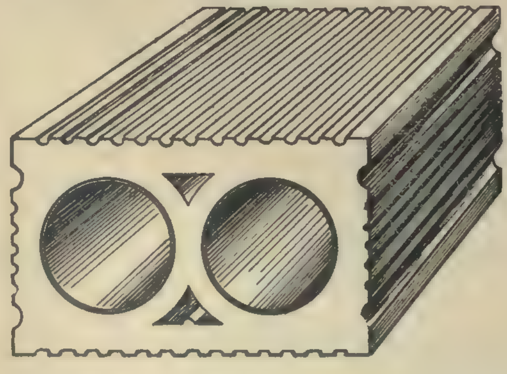

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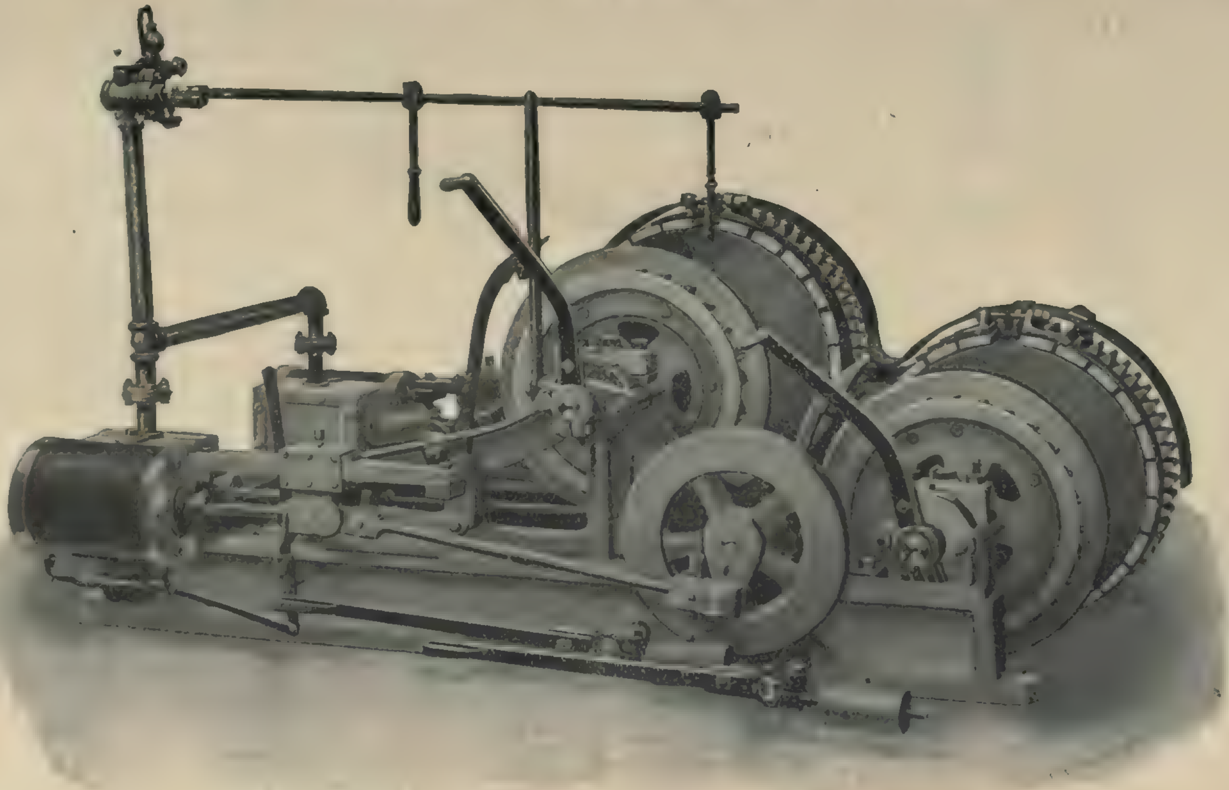

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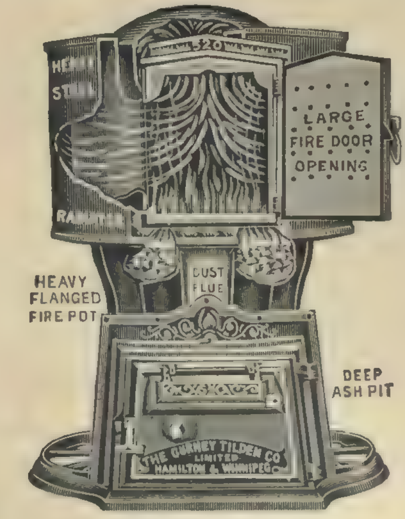

The New Idea Warm Air Furnace

Ordinarily cheap grates may be instantly detected by the method of fastening them in the furnace. **Fastenings that require or consist of small bolts, cotter pins, etc., are the earmarks of cheapness in furnace construction.** They not only require various kinds of tools, such as hammers, chisels, wrenches, screw-drivers, etc., but in nearly every case they **stick** and **bind** and are practically useless after the furnace has been in use a few weeks. Removing the grates from such a furnace is usually a case of loss of time and temper, ending up with breakages that cost money. It is different with the New Idea Grates. They are kept in position by a solid iron bar, $1\frac{1}{4} \times \frac{1}{2}$ inches, and from eighteen to twenty-four inches long according to size of furnace. This bar drops easily into a deep strong slot at either end, from which it cannot possibly be displaced in any way except by lifting it out. To remove grate simply lift this bar out, and the grate slides bodily out on tracks provided for that purpose. There isn't another construction made that is half as simple or half as strong as the New Idea.

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Chilliwack, B.C.

The Elk Creek Waterworks Company are planning extensive improvements, including the laying of duplicate mains and the construction of a large reservoir.

Claresholm, Alta.

It is proposed to install a gravity system of waterworks here, at a cost, estimated by Engineer Arnold, of $54,000.

Goderich, Ont.

The council has decided to submit a bylaw to the ratepayers to issue $20,000 waterworks debentures.

Halifax, N.S.

The city's borrowing bill has been introduced before the Legislature. It provides for items including $50,000 for the construction of new sewers, and $2,400 for the city's share of the cost of permanent pavements.

Moose Jaw, Sask.

The ratepayers will vote on March 29th on a bylaw to issue $38,000 four and one half per cent., 40-year seyer debentures. John D. Simpson, Secretary-Treasurer.

New Liskeard, Ont.

The ratepayers will vote on March 26th on a bylaw to issue $5,000 five per cent. road debentures. E. Saskrider, Clerk.

Tenders will be received by H. Hartman, City Clerk, until April 15tn for the supplying of the various materials required in the extension of the new waterworks system. (See Advertisement.)

Ottawa, Ont.

Work is to be gone ahead with this spring in the extension of York street from Cumberland to Chapel street. The necessary bylaw has passed the city council and the city is now in possession of the lands required for the purpose. The estimated cost is $26,000.

Pembroke, Ont.

The Waterworks Committee will secure plans for a new water works system and submit same to the Council at the first meeting in May.

Saskatoon, Sask.

Tenders will be received by the City Clerk until April 13th for all labor necessary for laying water mains and sewer pipes, and for furnishing certain materials required for the work. (See Advertisement.)

Toronto, Ont.

A deputation from the Board of Trade waited upon the Board of Control last week to ask the city for assistance in improving the highways leading to Toronto. Mr. L. H. Clark, Chairman of the Good Roads Committee, stated that $600,000 was required to put the roads in a satisfactory condition. He suggested that the city should contribute $100,000. Due consideration was promised.

Notice is given of the city's intention to carry out a long schedule of local improvement works, comprising sewers, concrete curbing, asphalt pavements and concrete sidewalks. W. A. Littlejohn, City Clerk.

Victoria, B.C.

At a recent meeting of the City Council a motion was passed in favor of brick paving for the proposed causeway.

Vancouver, B.C.

At a recent meeting of the Board of Works, the report of City Engineer Clement was adopted. The recommendations include the construction of a 24-inch storm sewer on Burrard street and a 20-inch sewer on Robson, estimated cost $4,800; also an extension of the sewer on Napier street to Lakewood drive, estimated cost $2,150.

The Canadian Agency of London, Eng., has made an offer to the municipalities of South Vancouver, Point Grey, Richmond and Burnaby for the construction of a combined waterworks system through these districts. The company offers to furnish everything for the installation of the system and is willing to have plans of the pipe lines from Seymour creek made by local engineers. It is proposed to secure the services of competent engineers with a view to obtaining estimates, etc.

Winnipeg, Man.

The Board of Control has placed the asphalting of Buell street upon the order sheet. Estimated cost, $9,781.

At a meeting of the executive committee of the Northwest Winnipeg Ratepayers Association, last week, it was decided to ask for the immediate construction of water mains on Selkirk, Pritchard, Manitoba and Magnus, between Battery and McPhillips streets.

AWARDED.

Brantford, Ont.

Following were the successful tenderers to the city for supplies for the year: Paving brick, Louis H. Gipp, Buffalo; lumber, Mickle, Dyment & Company and Schultz Bros. Company, Limited, city; special castings, Hartley Foundry Company, city; cement, Ontario Portland Cement Company, city; sewer pipe, Toronto & Hamilton Sewer Pipe Company, Hamilton.

Hamilton, Ont.

The Hamilton and Toronto Sewer Pipe Company have been awarded the contract for the supply of sewer pipe for the year 1909 for the cities of Brantford, London and Kingston.

London, Ont.

The Brick Manufacturing and Supply Company have been awarded the contract for the supply of sewer pipe to the city for 1909. The contract is for the Hamilton pipe manufactured by the company.

Winnipeg, Man.

The contract for supply of sewer pipe for this city has been awarded to W. F. Lee at $8,420.

The contract for a street washing machine has been awarded by the Board of Control to a German firm at $1,475, this being the lowest tender received. J. L. Neilson and Sons are local agents for the company.

Railroads, Bridges and Wharves

Belwood, Ont.

Tenders addressed to T. Goodall, Township Clerk, will be received until March 26 for the construction of an arch bridge, 35 foot span, 14 feet wide, across the Irvine river. Plans and specifications on application.

Blanchard Township, Ont.

A bylaw will be submitted on April 5th to provide for a bonus of $50,000 to the St. Mary's and Western Ontario Railway.

Edmonton, Alta.

The Public Works Department has selected sites for the proposed high level bridges. The cost of the two structures is estimated at $278,000 to $513,000.

New Hamburg, Ont.

A bylaw is being submitted to the ratepayers offering them the opportunity of becoming shareholders in the People's Railway to the extent of $20,000.

St. Thomas, Ont.

Tenders addressed to J. A. Bell, County Engineer for Elgin, St. Thomas, Ont., will be received until April 2nd for the construction of a bridge over the Catfish creek at Jamestown, township of Yarmouth; also for the construction of concrete abutments for a bridge to be built over the Otter creek at Richmond, township of Bayham; both these bridges to have concrete floors. Tenders will also be received up to the same date for the furnishing and driving of about 250 piles in Kettle creek at Port Stanley. Plans and specifications may be obtained on application.

St. John, N.B.

Louis Coste, consulting engineer of the Dominion Public Works Department, will at once prepare plans for the proposed G. T. P. terminals.

Toronto, Ont.

City Engineer Rust has been instructed to prepare plans for the erection of a wooden bridge on the present foundations for repairs to Winchester street bridge. It was originally intended to expend $15,000 for this purpose. Plans have been altered owing to the possibility of a viaduct being constructed over the Don at Wellesley street.

AWARDED

Cochrane, Ont.

For the new buildings to be erected by the T. & N. O. Railway, nineteen tenders were received. The contracts for the round house, machine shop, locomotive foreman's office, coal chute and trestle, and reinforced concrete and culverts, at mile posts 218 1 2, 221 and 222 1 2 were awarded to the Forest City Paving and Construction

Company, London. The contract for the installing of the heating system in the round-house and machine shop was given to Sheldon's Limited, of Galt. Work will be commenced at once.

Fredericton, N.B.
Tenders were recently opened at the Public Works Department here for the new masonry sub-structure for the Fredericton bridge. The work comprises four cut granite piers and abutment, with concrete embankment walls. The tender of Jos. MacVay & Son, of St. Stephen, was accepted, the price being upwards of $40,000.

Winnipeg, Man.
It is stated that the contract for the erection of the National Transcontinental Railway shops has been awarded to M. J. Haney and Company at a figure in the vicinity of $1,500,000.

Public Buildings, Churches, Schools, etc.

Atherley, Ont.
Tenders addressed to R. Leith will be received until March 31st for the erection of a brick school house. Separate tenders for stonework, brickwork, plastering, carpentry and metal work. Plans on application.

Battleford, Sask.
The town has offered a free site of 1,000 acres for the Saskatchewan university.

Brockville, Ont.
A by-law has been passed to issue $5,700 to provide for the cost of enlarging and equipping the isolation hospital. Geo. K. Dewey, Town Clerk.

Bridgewater, N.S.
Tenders addressed to N. Tessier, Secretary, Department Public Works, Ottawa, will be received until March 25th for fittings for the post office at this place. Plans may be seen on application to T. Cohoon, caretaker, public building, Bridgewater, and at the Department of Public Works, Ottawa.

Calgary, Alta.
At a recent meeting of the school trustees, a deputation from Hillhurst and Sunnyside waited upon the Board to urge the erection of a new school building.

Chilliwack, B.C.
A by-law will be submitted to the ratepayers to raise $5,000 for the erection of a new school.

Collingwood, Ont.
The Board of Education have submitted to the City Council a scheme for the erection of a new school in the West ward to cost $20,000. It is desired to have it ready for occupation at the beginning of 1910.

A new exhibition building will be erected this season.

Dauphin, Man.
Plans have been submitted in the competition for the proposed new school building, but no selection has yet been made.

Kamloops, B.C.
The City Council are considering the erection of a new city hall.

Plans have been prepared for a modern Y. M. C. A. building to cost $24,000.

Kingston, Ont.
The Frontenac County Council are considering the extension of the county jail.

Kingston, N.B.
The Consolidated School at this town was destroyed by fire last week at a loss of $40,000.

Lanigan, Sask.
The Provincial Government have promised to build a creamery at this place.

Lethbridge, Alta.
C. B. Bowman, Secretary, Trustees Galt Hospital, will receive tenders until April 10th for the erection of a fireproof hospital building. Plans and specifications at offices of Osler, Hammond and Nanton, Winnipeg; L. Mewburn, Calgary, and C. B. Bowman, Lethbridge.

Moorehead, Man.
The Presbyterian church at this place was recently burned down at a loss of $5,000.

Moosomin, Sask.
The High School Board have decided to submit to the ratepayers a by-law to raise $20,000 for the erection of a collegiate institute.

Montreal, Que.
The damage to the Windsor street station caused by the recent train disaster is estimated by Building Inspector Chausse at $20,000.

The Blumenthal Estate will erect a vaudeville theatre on Bleury street. Plans have been prepared by Mitchell & Creighton, architects, this city.

It is stated that the proposed new railway terminals, now being considered by the C. P. R., G. T. R. and the Government, will involve an expenditure of from $10,000,000 to $12,000,000.

Tenders addressed to L. O. Davis, City Clerk, will be received until March 30th for improvements to the St. Jean Baptiste Market, St. Lawrence Boulevard. Plans and specifications may be seen at office of L. R. Montbriant, architect, 230 St. Andre street.

North Dorchester, Ont.
Tenders close March 26th with C. Rouse, Crampton, Ont., for the erection of a two-roomed school building here. W. G. Murray, architect, London, Ont.

Newington, Ont.
The Stormont Hall was destroyed by fire last week.

Owen Sound, Ont.
Plans for the remodelling of the town hall are again under discussion.

Ottawa, Ont.
Rev. M. J. Bieber is in the city with the view to forming a new English Lutheran church.

Plans have been completed for the proposed addition to the Rideau Club building. Legislative authority is being secured for a bond issue to cover the cost.

Building operations will shortly be commenced in connection with the proposed consumptive home. The Anti-Tuberculosis Society expect to have the structure completed by next fall. Tenders for this building were taken about six months ago but no tender was let. It is possible, therefore, that fresh tenders will be invited.

Port Arthur, Ont.
The city has offered to the government a free site for the Ontario provincial prison.

Port Granby, Ont.
Tenders addressed to William Payne will be received until March 25th for a new school building for S. S. No. 1, Clarke. Plans and specifications may be seen on application.

Quebec, Que.
The Roman Catholic convent at Point Esquimaux, on the North Shore, was destroyed by fire last week at a loss of $14,000.

Richibucto, N.B.
The time for receiving tenders for the construction of the new public school to be built here has been extended from March 20th until March 27th. Plans and specifications prepared by L. R. Fairn, Aylesford, N.S. For particulars, address Dr. Thos. Bourque, Chairman of School Trustees, Richibucto.

Stratford, Ont.
The City Council have approved plans for a new four-roomed addition to the Shakespeare school.

Sackville, N.B.
Burke and Horwood, architects, Toronto, will prepare plans for a five storey addition to the Mount Allison Ladies' College.

St. John, N.B.
A campaign has been inaugurated to raise $100,000 to establish a Sailors' Home in this city.

F. N. Brodie has prepared plans for alterations to the theatre owned by F. G. Spencer.

Saskatoon, Man.
A site has been selected for the proposed $100,000 high school.

Selkirk, Man.
Tenders close March 31st for electric light fixtures for the Selkirk public building. Address N. Tessier, Secretary, Department Public Works, Ottawa.

Toronto, Ont.
Tenders close February 26th with W. C. Wilkinson, Secretary-Treasurer, Board of Education, for the completion of the Kent school, Dufferin street, and for an addition to the Riverdale High School.

Dr. Sheard, Medical Health Officer, advises the erection of a crematory on Bridgeman avenue, north of the C. P. R. tracks, at an estimated cost of $45,000.

The Board of Control recently opened tenders for the palm house in the Allan Gardens, including masonry, carpentry, roofing and plumbing work. The lowest tenders amounted to $35,538, exclusive of the heating apparatus. The City Architect expressed the opinion that $7,000 would have to be added for that purpose. The board decided to hold over the tenders with a view to ascertaining if the City Council will provide the extra money.

The trustees of the new general hospital have appointed Dr. Holmes, of Cincinnati, Ohio, consulting medical expert upon the hospital plans. Plans are stated to be nearly completed.

Winnipeg, Man.
The St. George Snowshoe Club has decided to build a club house at a cost of $12,000.

Work is to be commenced at once on the new addition to St. Mary's Academy. The building will be four storeys high, of brick construction and will cost $80,000.

Preliminary sketches have been prepared for the new Builders' Exchange. If the present plans are followed, the proposed building will be erected after the style of the new Grain Exchange.

Tenders are being called for the new Sunday school for the Augustine Presbyterian church. The building will be of stone, fireproof construction, steam heating, and will cost from $20,000 to $25,000. J. H. G. Russell is the architect.

The Franciscan Sisters of this city are considering the erection of a Home for Women, adjoining the Immaculate Conception church.

The Winnipeg Golf Club contemplate the erection of a large club house.

It is expected that tenders will shortly be taken for the erection of the proposed sanitarium at Ninette. Smith and Bruce, architects, this city.

Plans for the proposed extension of the court house, estimated to cost $200,000, are still under the consideration of the local government.

The North Winnipeg curlers are negotiating for a site for a proposed new curling rink. The special committee consists of R. Jacob, H. J. Clare, H. J. Pearson, J. P. Wallis and J. F. Palmer.

The River Heights Country Club, an offshoot of the Wanderers' Cricket Club, will erect a modern club house.

It is probable that there will be erected this year either a new provincial asylum for the insane or a large addition to one of the present buildings.

Yorkton, Sask.
J. H. G. Russell, architect, Winnipeg, has submitted plans for the proposed new St. Andrew's Presbyterian church.

AWARDED.

Minnedosa, Man.
F. W. Mercer, of this town, has obtained a contract at $16,000 for the erection of a new six-roomed school building.

Ridgetown, Ont.
The contract for the new township hall has been awarded to W. E. Best, of Thamesville, at $3,467.

Toronto, Ont.
The Public Library Board have awarded to the Berlin Interior Hardwood Company, at $435, the contract for the counters and fittings for the Queen and Lisgar branch library. Keith and Fitzsimmons, at $162, were the successful tenderers for lighting and steam fittings.

Winnipeg, Man.
The Aikenhead Hardware Company, Limited, Toronto and Winnipeg, have obtained the hardware contract for the new Union depot of the Canadian Northern Railway Company.

Residences

Bridgeburg, Ont.
Leonard Foulds, architect, 43 Victoria street, Toronto, has prepared plans for a two storey residence to be erected here for Mr. John Jones, at a cost of $2,500.

Davisville, Ont.
E. C. Wilson, architect, 77 Victoria street, Toronto, has prepared plans for a two and a half storey residence to be erected here for Mr. Davis, at a cost of $4,000.

Hamilton, Ont.
Alderman Cooper is negotiating for a site in the east end of the city, where he will erect six brick houses.

Huntsville, Ont.
Mr. J. H. Johnson will erect a two storey residence at a cost of $3,500. J. H. Galloway, 77 Victoria street, Toronto, is the architect.

London, Ont.
Mr. John Heyman has purchased the property at the corner of Wellington and Queen's avenue, on which he will erect a large apartment house.

Moore & Henry will erect a terrace of four residences, two storeys and basement in height, at the corner of Colborne and Queen's avenue, for Mr. Arthur McClary.

Meaford, Ont.
Ellis & Connery, architects, Manning Chambers, Toronto, nave prepared plans for a $3,000 residence to be erected here, for Mr. Geo. Carnahan. The building will be of brick construction.

Ottawa, Ont.
W. G. Hunt, architect, 255 Westmoreland avenue, Toronto, has completed plans for a two storey apartment house to be erected here for Mr. J. McMurchy, James street, at a cost of $8,000.

Port Credit, Ont.
Mrs. Madigan is reported to have sold a site of eight acres to a Toronto man who will build a large summer residence.

Toronto, Ont.
E. G. Wilson, architect, 77 Victoria street, has drawn plans for a two storey brick residence to be erected on Sorauren avenue, near Roncesvalles avenue, for Mr. Dinsmore, at a cost of $3,000. Mr. Wilson has also prepared plans for a brick residence to be erected on the south side of Langley avenue, near Broadview, for J. A. Gallagher, corner Langley and Broadview.

J. H. Cowan, architect, 65 Adelaide street east, has prepared plans for a two and a half storey residence to be erected on Palmerston boulevard, near Harbord street, at a cost of $5,000.

Recent building permits include: J. J. Downey, 2 storey and attic brick dwelling, Sunnyside avenue, $3,000; R. Ransome, pair semi-detached 2 storey brick dwellings, St. Clarens avenue, $4,000; Dr. J. Thorburn, 2 storey frame dwelling, east end Lake Shore Road at Island, $3,000; J. E. Peterkin, pair semi-detached 2 storey brick dwellings, Alhambra avenue, $4,000; James Crothers, pair semi-detached 2 storey brick veneer dwellings, Curzon, $3,500; B. H. Morehouse, 3 attacued 2 storey roughcast dwellings, brick fronts, Langley avenue, $5,000; Henry Martin, 2 pairs semi-detached and 1 detached 2 storey roughcast dwelling, brick fronts, Endean avenue, $6,600; J. S. Case, 2 detached 2 1-2 storey brick dwellings, Westminster avenue, $8,000; Charles Jolliffe, pair semi-detached 2 1-2 storey brick dwellings, Kendal avenue, $6,500; Walter J. Leach, 2 storey and attic brick dwelling, Westminster avenue, $4,000; J. J. Downey, 3 pairs semi detached 2 storey brick dwellings, Roncesvalles avenue, $12,000; T. W. Murray, 2 1-2 storey brick dwelling, Indian road, $4,500; Scott Griffin, 2 1-2 storey brick dwelling, near Poplar Plains road, Clarendon avenue, $14,000; Stewart & Raymo, 3 storey brick apartments, Gerrard street, $25,000; S. Rabinovitch, 2 storey brick dwelling, Gerrard street, $2,500; J. J. Downey, 2 storey and attic brick dwelling, Sunnyside, $3,200; George Eccles, 2 storey brick dwelling, Shaw street, $2,500; H. G. Marshall, 2 1-2 storey brick, dwelling, corner Poplar Plains road and Macpherson avenue, $2,500; E. J. Crocker, 1 pair semi detached 2 storey brick dwellings, Munro street, $2,800; W. J. Robson, 2 storey brick dwelling, Gladstone avenue, $2,500; William Mulholland, 2 storey brick dwelling, Dovercourt road, $2,800; A. M. Bennett, 2 1-2 storey brick dwelling, Baldwin street, $2,500; Mrs. A. A. Bryant, pair semi-detached 2 1-2 storey brick dwellings, Fernbank avenue, $6,000; A. A. Gray, 2 storey and attic brick dwelling, Geoffrey street, $3,000; Henry Lefroski, 2 storey and attic brick dwelling, Grace street, $2,500.

Vancouver, B.C.
G. E. Williamson has obtained a permit for the erection of an apartment house at the corner of Ontario street and Tenth avenue. Estimated cost $20,000.

Alderman R. C. Vaughan will build 24 houses in the north end of the city this season.

Edward Hobson has prepared plans for a three storey store and apartment building to be erected at the corner of Smithe and Homer streets.

Weston, Ont.
P. H. Finney, architect, 43 Victoria street, Toronto, has prepared plans for a two and a half storey dwelling to be erected here for Mr. Irwin, of Nobleton, Ont.

Winnipeg, Man.
J. H. Russell has just taken tenders for a new residence on Wellington crescent for J. J. Windrum.

Northwood & Noffke have plans under way for several residences, the average cost of which is $10,000.

C. B. Piper, vice-president of the Winnipeg Elevator Company, has obtained a permit for a new residence on Kingsway to cost $10,000. J. H. G. Russell, architect.

A. Galbraith has obtained a permit for a dwelling on Burnell street to cost $3,000.

Tenders addressed to G. G. Teeter, architect, 536½ Main street, will be received until March 25th for alterations and additions to No. 110 Lewis street.

AWARDED.

Hamilton, Ont.
J. Stephenson has been awarded a contract for the construction of two brick houses on Charlton avenue at a cost of $3,200.

Kincardine, Ont.
The Summer Cottage Syndicate have awarded to Clements Bros. a contract for the erection of ten cottages.

Toronto, Ont.
Joseph Hutchison, 317 Spadina avenue, has been awarded the general contract for a pair of two and a half storey dwellings to be erected on Huron street, between D'Arcy and Baldwin streets, for Mr. Geo. Lowe, 106 Huron street. Estimated cost, $5,000. Architect, H. G. Paull, 395 College street.

Business Buildings and Industrial Plants

Dartmouth, N.S.
The Consumer's Cordage Company may remove from Montreal to this town.

Davidson, Sask.
The ratepayers have turned down a proposition for the erection of a flour mill, the terms being considered unsatisfactory.

Dauphin, Man.
A modern brick livery stable will be erected here this season by Caldwell & Willis.

Durham, Ont.
W. A. McGowan will receive tenders until March 24th for the construction of an oatmeal mill at this town. Plans and specifications may be seen at the office of J. P. Telford. Tenders are also asked for

(Continued on page 23)

Tenders and For Sale Department

Notice to Contractors

Tenders will be received by the Alvinston School Board until FRIDAY, APRIL 2ND, for a Hot Air System of Heating, including proper ventilation for the use of the Alvinston Public School. The lowest or any tender will not be accepted unless otherwise satisfactory.

13 ALEX. M. PHAIL, Secretary.

Tenders for New School Building

Tenders for the erection of a four roomed school in the town of Ingersoll, Ontario, will be received up to SATURDAY, NOON 27TH, MARCH, 1909.

Plans and specifications may be seen at the office of W. A. Sudworth, Secretary of Board of Education, Ingersoll, Ontario, or at the office of Taylor & Taylor, Architects, Brantford, Ontario.

All tenders to be addressed to H.F. Boyse, Esq., Chairman of property Committee, Ingersoll, or to Taylor & Taylor, Architects, Brantford, Ontario.

The lowest or any tender not necessarily accepted. 12

Tender for Library

Sealed tenders marked "Public Library Tender" and addressed Secretary of Calgary Public Library, P. O. Box 1827, Calgary, Alberta will be received up to noon of

Thursday, April 15th,

for the erection of a Public Library in the City of Calgary.

Plans and specifications may be seen at the Court House, Calgary, (Sheriff's Room) up to 4 p.m., April 14, 1909.

Copies of the specifications may be obtained from the undersigned upon payment of the cost of transcription.

The lowest or any tender will not necessarily be accepted.

By order of Board,
12 E. L. HILL, Secretary.

Temiskaming and Northern Ontario Railway Commission

Sealed tenders addressed to the undersigned and marked on the envelope "Tender" will be received up to 12 o'clock noon on WEDNESDAY THE 14TH APRIL for the following works:—

1. **Culvert near Mileage 21½.**
2. **5 ft. Arch Culvert near Mileage 50¾.**
3. **20 ft. 1 Beam Span near Mileage 62½.**

Plans and specifications may be seen at the office of the Secretary-Treasurer, 25 Toronto St., Toronto, or at the office of the Chief Engineer, North Bay.

Forms of tender and amount of deposit necessary in respect of each item can be obtained on application to the Secretary-Treasurer at above address.

Lowest, or any tender, not necessarily accepted.

A. J. McGEE,
Secretary-Treasurer.

25 Toronto St., Toronto,
March 18th, 1909.

Papers inserting this advertisement without authority will not be paid for same. 14

City of Medicine Hat

Tenders for Gas Well

Tenders for the drilling of a well for the city will be received at the office of the undersigned up to APRIL 30TH, 1909.

Tenders to be given as follows: The contractors to furnish all labor, pipe, machinery and material; anchor and sheet in well in a practical manner.

The city to pay for all pipe, which is necessary to leave in the well or the contractor may tender to furnish labor only, anchor and sheet in well in a practical manner.

Specifications may be obtained by applying to undersigned.

W. P. MORRISON,
14 City Commissioner and Engineer

City of Calgary

Tenders will be received by the Commissioners of the City of Calgary, addressed to the undersigned, marked,

"Tenders for Sewer Pipe or Water Pipe"

up to 4 p.m. of the 22ND DAY OF MARCH, INST., for supplying the City of Calgary with the following:

Sewer Pipe—Single and Double Stength

4" ft.	6" ft.	8" ft.	9" ft.	10" ft.
26,000	8,250	2,416	3,100	13,270

12" ft.	18" ft.	20" ft.	24" ft.	30" ft.
8,400	5,480	2,200	5,246	9,200

Specials—Ys, Ts, and Bends

1,250 350 100 125 700 350 250 100 220 400

Water Pipes—All Sizes

6" Pipe	12" Pipe
41,140 Lin. ft.	5,000 Lin. ft.

The Commissioners do not bind themselves to accept the lowest, or any tender.

H. E. GILLIS,
City Clerk.

Dated at Calgary, March 1st, 1909. 12

Town of Fort Frances

Ontario

Tenders Wanted

Sealed tenders will be received by the Town Clerk until 8 p.m on THURSDAY THE FIFTEENTH DAY OF APRIL, 1909 for certain materials for Water Works and Sewerage Works as follows:

Contract "A" All labor necessary for constructing the water works distribution system and certain materials therefor.

Contract "B" All labor for constructing sewerage system and certain materials therefor.

Contract "C" The supplying of cast iron pipes, and special castings.

Contract "D" The supplying of gate valves and hydrants.

Contract "E" The supplying of vitrified tile pipe.

Contract "F" The supplying of manhole covers, etc.

Plans and specifications may be seen at the office of the Town Clerk, Fort Frances, also forms of tender may be had on application to the Town Clerk.

W. H. ELLIOT,
H. WILLIAMS, Esq., Town Clerk.
Mayor of For Frances. 12

Tenders for Cement Walks

The Board of Works of the Town of Berlin will receive tenders up to MARCH 31ST, next, for constructing Cement Walks during the year 1909. Specifications may be seen at the office of the Town Engineer, Wm. Mahlon Davis.

The lowest or any tender not necessarily accepted.

NICHOLAS ASMUSSEN,
Chairman

Berlin, March 12th, 1909. 12

TENDERS

Tenders will be received by the undersigned until noon on FRIDAY, THE 2ND APRIL, for the construction of a Bridge over Catfish Creek at Jamestown, Township of Yarmouth; also for the construction of Concrete Abutments for a Bridge to be built over the Otter Creek at Richmond Township of Bayham. Both these bridges to have concrete floors. Also for the furnishing and driving of about 250 piles in Kettle Creek at Port Stanley. Plans and specifications can be seen at this office, where blank forms of tender can be obtained.

JAS. A. BELL,
13 County Engineer.

Town of New Liskeard

Waterworks

Tenders will be received by the undersigned until the 15TH DAY OF APRIL, 1909, for the supplying of Cast Iron Water Pipe and other Castings, Valves, Hydrants, and for excavating and refilling Trenches and Laying Pipes, Setting up Hydrants, etc., for the extension of the New Liskeard Waterworks System, there being about seven thousand nine hundred feet of six inch and four inch pipe to lay. Plans specifications of the work, etc., form of agreement and bond may be seen and form of tender may be obtained at the office of C. H. Fullerton, Town Engineer, New Liskeard.

H. HARTMAN,
Clerk.

New Liskeard, March 10, 1909. 15

Positions Wanted or Vacant

ENGINEER WANTED to take charge of power station; must understand engines, boilers and electrical apparatus; state salary and experience. INGERSOLL ELECTRIC POWER AND LIGHT COMPANY, Ingersoll. 12

A GOOD GRANITE and MARBLE LETTERER wanted; must be sober; state wages wanted. Address 47 Chatham Street, Brantford, Ont. 12

WANTED AT ONCE—foreman to take charge of sash and door factory; must be thoroughly posted in all branches of factory work and well recommended. Apply to S. C. SMITH LUMBER COMPANY, LIMITED, Vernon, B C. 12

WANTED A GOOD BRICKMAKER—The North Bay Brick & Tile Co. want a brickmaker on May 1st, familiar with the Shelden steam dryer, to manufacture 20,000 red brick daily; applicants will state experience and reference. Apply to J. H. MARSHALL, President, Box 197, North Bay. 12

Machinery Wanted or For Sale

CONCRETE MIXER WANTED—Smith mixer, on skids; without power; 9 or 13 foot capacity. Apply, stating how long in use and lowest price, A. DAVIS & SON, LIMITED, Kingston, Ont. 12

Canadian Agents Wanted

A British firm manufacturing Tiles, Mosaics, Faience, Terra Cotta, etc., wants Canadian agents in Toronto, Winnipeg, Montreal and other large cities. Correspondence confidential. Box 140 CONTRACT RECORD, Toronto. 12

Tenders for Cement

Sealed tenders will be received by the undersigned for the cement required by the Corporation of the Town of Galt for the year 1909 estimated at 1,000 barrels more or less and to be delivered as required.

Sacks when empty will be returned to the party making the contract.

Tenders to be in not later than THURSDAY, APRIL 1ST, 1909.

JOSEPH McCARTNEY,
Town Clerk, Galt.
12

Underground Cable

Tenders for Underground Cable will be received up till APRIL 30TH by the City of Toronto, Canada. For specifications and form of tender apply Electrical Department, City Hall.

Notice to European firms—For specifications and form of tender apply Preece & Cardew, 8 Queen Anne's Gate, Westminster, London, S.W., England. 14

CITY OF SASKATOON
Province of Saskatchewan

Tenders for Excavating and Pipelaying

Sealed tenders will be received by the City Clerk until 8 p. m. on TUESDAY, APRIL 13TH, 1909, for all labor necessary for laying Water Mains and Sewer Pipes, and furnishing certain materials therefor according to plans and profiles dated April 1st, 1909.

Plans and specifications may be seen at the office of the Chief Engineer, 103 Bay street, Toronto, or at the office of the City Clerk, Saskatoon, on and after April 1st, 1909.

WM. HOPKINS, Esq., Mayor, Saskatoon.
J. H. TRUSDALE, Esq., City Clerk, Saskatoon.
WILLIS CHIPMAN, C. E.,
103 Bay street, Toronto, Ont. 15

Business Buildings and Industrial Plants

(Continued from page 21)

about 700 yards of gravel, suitable for concrete, delivered at mill site.

Eburne, B.C.
Construction will shortly commence upon a large elevator to be erected by J. C. White, of Duluth, Minn.

Edmonton, Alta.
It is stated that the projected improvement to the Castle hotel will involve an expenditure of $100,000. The new additions will be of solid brick with stone trimmings. Elevators and telephones will be installed. The corridors on each floor will be made fireproof. Architects, E. C. Hopkins and Edmond Wright. J. A. Hendry manager.

Emerson, Man.
The Oddfellows have purchased a site for the erection of a lodge room and two stores.

Halifax, N.S.
The Riverside hotel, nine miles from this city, was recently destroyed by fire. Angus Bowser, proprietor.

Hamilton, Ont.
Hawkins & Holt will build a pair of brick stores at the corner of Emerald and Barton streets.

The Bank of Montreal are stated to have plans for the erection of a branch office at the corner of Victoria avenue and Barton street.

The Hamilton Bridge Company will shortly start work upon several additions to their plant.

Stewart & Witton are working upon plans for the new Spectator building. They have several smaller works on hand.

Architect Now is preparing plans for the new factory to be erected at the corner of Maple avenue and Trolley street for Wagstaffe Limited, at a cost of $15,000.

A brick storehouse, 100x60 feet, will be erected this season by the Crescent Oil Company.

London, Ont.
The Peters' confectionery store and the Higgins block were damaged by fire March 22nd at an estimated loss of $15,000.

Linwood, Ont.
Tenders for the construction of a stone foundation and brick building close March 25th with George Brenner.

Lockwood, Sask.
M. McLeod will erect a large general store this spring.

Melita, Man.
The Farmers' Elevator Company have plans for the erection of a new elevator.

Minnedosa, Man.
The flour mill at this place, owned by T. J. McDermott, was destroyed by fire last week at a total estimated loss of $10,000.

Montreal, Que.
The Kent Company, Limited, have been incorporated with a capital of $50,000 to manufacture and deal in all kinds of ice-making and refrigerating machinery, etc.; also corkboard insulation for cold storage buildings. The provisional directors include W. G. Kent, G. Darling and A. W. Moffatt.

The Hotel Dieu is to be extensively remodelled. Construction has commenced.

It is stated that plans have practically been completed for the erection of a new $3,000,000 hotel on Phillips square. The present lessees of the St. Lawrence hall are stated to be interested.

It is stated that the new building to be erected by the Banque Nationale will be ten storeys high and will cost $1,000,000. Mr. A. J. Higgins, this city, is interested.

Paris, Ont.
The ratepayers will vote March 26th on a by-law to guarantee the bonds of the Sanderson-Harold Company to the extent of $25,000. Thos. McCosh, Town Clerk.

Port Arthur, Ont.
Tenders will be received until March 27th for a reinforced concrete office building. Darling and Pearson, Canada Life Building, Winnipeg, architects.

Peterborough, Ont.
Tenders will be received until April 1st for the erection of a building on George street. Plans at office of J. J. Lundy, 417 Water street. J. E. Belcher, C.E., architect.

Red Deer, Alta.
Fleming & Hamilton will immediately erect a brick business block upon a site adjoining the post office.

Sarnia, Ont.
The G. T. R. freight sheds, opposite the Arlington hotel, will be remodelled and converted into a passenger and freight depot for the Northern Navigation Company.

St. Marys, Ont.
It is stated that a number of St. Marys and Owen Sound capitalists, who intend to form themselves into a cement company, and who have taken a number of options on rock and clay land, have bought out a Brantford syndicato's option of 50 acres of rock and clay land on the John Legg farm adjoining the Horse Shoe Quarry. Work will probably commence this spring.

Toronto, Ont.
The coal elevator at West Market street, owned by Wilson & Son, scale manufacturers, was destroyed by fire last week.

The foundry of William Keating, at the rear of 237 Lansdowne avenue, was recently burned down at a building loss of $3,000.

J. V. Bick has a permit for the erection of three attached three storey brick stores and dwellings on Gerrard street east. Estimated cost $6,000.

Three attached two storey and basement brick stores and dwellings will be erected on Queen street east by Cecil Lee at a cost of $6,000.

It is stated that a large building will shortly be erected at the southwest corner of Yonge and Richmond street. Construction will start upon the expiration of the leases of the two stores now on the property.

The Mason & Risch Piano Company have purchased from Mr. Albert Britnell the property at 241 Yonge street, upon which they will erect a large new building.

Vancouver, B.C.
The licensees of the Sherman house will erect a new four storey structure on Westminster avenue, between Harris and Barnard streets.

F. L. Leighton, managing director of the Vancouver Engineering Works, states that by June 1st his company will expend $100,000 in the construction of their proposed new building and plant.

The C. P. R. may erect a large grain elevator here this season.

The Trustee Company, of this city, is planning to erect several large buildings. The first of these, the Mercantile Building, will be eight storeys in height and will occupy the old site of the lighthouse hotel. The building will be of reinforced concrete construction and will be replete with all modern improvements. The cost is estimated at $175,000. The Dominion Trust Company (J. B. Mathers, president and general manager) is agent for the Trustee Company.

A permit has been issued for the new three storey brick block to be erected for Mr. Joseph Reade on Cordova street at a cost of $27,000. Baynes & Horie have the general contract.

It is stated that an option has been taken upon 3,000 feet of the waterfront at North Vancouver, controlled by Mr. E. W. McLean. The prospective purchasers are stated to have important plans for industrial purposes.

Wilkie Allen, architect, this city, has completed plans for the new Grandview hall to be erected by Mr. Hary Evans at a cost of $10,000.

Ex Mayor Buscombe has taken out a permit for the erection of a warehouse on Beatty street. Estimated cost, $20,000.

It is stated that Seattle capitalists are contemplating the establishment of a large manufacturing plant for locomotives and logging engines. Their representatives are said to hold an option on a site of ten acres in the east end of the city.

Winnipeg, Man.

Preparations are being made for an early start upon the construction of the new Princess hotel.

W. W. Blair, architect, has prepared plans for important extensions to the Queen's hotel. Four storeys will be added to the structure.

Tenders will be received until March 29th for an extension to the building at 289 Garry street, owned by Chaffey and Verhooven. J. Woodman, architect.

The warehouse and shops of the Stuart Machinery Company were damaged by fire last week at a loss of $10,000. W. A. McLeod, manager of the company, states that the structures will be rebuilt at once.

Thomas Ryan will erect six one storey stores on Princess at a cost of $4,000.

Montreal, Que.

It is stated that a large twelve storey structure, with an arcade, is to be erected on Main street, opposite the city hall, by Mr. M. Fraser, of this city.

V. W. Horwood, architect, this city, is preparing plans for a new hotel to be built by the Winnipeg & Lake of the Woods Development Company, Limited, on Keewatin bay. The hotel will be built on the bungalow plan and will be equipped with all modern improvements. A number of three-roomed cottages will be put up in connection with the hotel. Total estimated cost, $40,000.

Welland, Ont.

It is stated that a large American concern is negotiating with the council with a view to establishing a branch factory here.

Weyburn, Sask.

Frank Moffet will erect a two storey brick block early this season.

AWARDED.

Hamilton, Ont.

Contracts for the new building to be erected by the Mills Hardware Company have been awarded as follows: Masonry, Howard & Webber; carpentry, McKellar & Poag; structural steel, Hamilton Steel & Iron Company. The store building will be 121x120 feet, and will be constructed of structural steel beams manufactured by the Hamilton Bridge Company. The buildings to be erected comprise five stores, a central heating plant and a stable. Total estimated cost $100,000. Architect, Chas. Mills.

Regina, Sask.

It is stated that the Robert Simpson Company of Toronto will erect a large departmental store here this summer.

Stratford, Ont.

J. L. Youngs has been awarded the contract for an extension to the factory of the Stratford Chair Company. Estimated cost $10,000.

Lessard & Company, plumbers and fitters, Montreal, Que., have registered.

Mr. Osler Wade has been appointed permanent liquidator of the Toronto, Waterloo Office Fixture Company, Limited, Waterloo, Ont.

The Stinson-Reeb Builders' Supply Company, of Montreal, have arranged for the sole Canadian agency of the Sackett Plaster Board and are prepared to appoint local agents throughout the Dominion.

Power Plants, Electricity and Telephones

Calgary, Alta.

A vote will be taken on April 2nd to issue $144,000 four and one-half per cent. 30 year debentures for electric plant, system and power.

Listowel, Ont.

The town of Listowel is submitting a bylaw to raise $12,500 for the construction of a municipal electrical system. Tenders have been received on boilers, engines, generators and line equipment and construction and provisional contracts for these are being let. C. H. and P. H. Mitchell, Toronto, are the engineers for the town.

Moulton Township, Ont.

The ratepayers will vote March 30th on a by-law to issue $5,000 five per cent. 20 year debentures as a bonus to the Dunnville, Wellandport & Beamsville Railway. Walter M. Allen, Clerk.

Stellarton, N.S.

The Edgerton Tramway Company, Limited, of Stellarton, have purchased the electric plant of the New Glasgow Electric Company, Limited. It is proposed to move the plant from New Glasgow to the former company's buildings at Stellarton, and to add new machinery to such an extent as to make the complete plant up-to-date in every way.

St. Louis de Mile End, Que.

Tenders close March 24th for wiring the ground floor of the local post office.

Toronto, Ont.

Tenders for underground cable required by the city will be received until April 30th. (See advertisement.)

Winnipeg, Man.

Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until April 2nd for supply of insulators, hardware, cross arms, cedar poles, top pins, etc., for the extension of the street lighting system. Specifications at office of City Electrician.

AWARDED.

Calgary, Alta.

Thee City Council has recently ordered from the Robb Engineering Company, Amherst, N.S., one 750 kw. Robb-Armstrong engine of the vertical enclosed high speed type, three crank, compound, for direct connection to a 500 kw. electrical generator.

Edmonton, Alta.

This city has recently ordered from the Robb Engineering Company, Amherst, two 600 h.p. Robb-Armstrong engines of the vertical enclosed high speed type for direct connection to electrical generators.

Toronto, Ont.

The T. Eaton Company, of Toronto, have recently ordered from the Robb Engineering Company, of Amherst, N.S., one 25 inch by 24 inch Robb-Armstrong simple Corliss engine for direct connection to a 300 kw. generator, also one 18 inch and 36 inch by 24 inch Robb-Armstrong horizontal cross compound Corliss engine for direct connection to a 300 kw. generator.

Vancouver, B.C.

The British Columbia Telephone Company have awarded to the British Insulated and Helsby Cables, Limited, a large contract for paper insulated air space telephone cables. This is in addition to the contract obtained last fall for 1909 delivery.

Winnipeg, Man.

The telephone commissioners have awarded to the Manitoba Cedar Company a contract for 50,000 poles.

The tender of the Lock Insulator Manufacturing Company of Victor, N.Y., has been accepted for supplying insulators for the power transmission line at $2.53 each, making a total of $14,625.

Miscellaneous

Balgonie, Sask.

The ratepayers will vote on March 26th on a bylaw to issue $2,000 six per cent. 25-year debentures for the purchase of land for park purposes; also, to issue $3,000 six per cent. 25-year town hall debentures. C. C. Rigley, returning officer.

Leamington, Ont.

Tenders are invited by M. Peterson, Mayor, until March 29th for the construction of a tile drain from the Heinz pickle factory to Lake Erie. Size of tile, 2 feet long and 1 foot in diameter; distance about 1 1-4 miles. Plans at the office of the Town Clerk.

Montreal, Que.

Tenders addressed to Ernest Marceau, Superintending Engineer of Canals for the Province of Quebec, will be received until March 29th for supplies required for Quebec canals for the season of 1909-1910. Forms of tender obtainable at the office of Mr. Marceau, 2 Place d'Armes, this city.

Medicine Hat, Alta.

The ratepayers will vote on March 26th on a bylaw to issue $36,000 five per cent. 30-year debentures for waterworks purposes; $22,000 five per cent. 20-year debentures for the purpose of extending the gas plant.

Toronto, Ont.

The by-law to raise $700,000 for the new sea wall will be submitted to the ratepayers on May 8th. A measure to provide money for new fire halls will be submitted on the same date.

Vonda, Sask.

The ratepayers will vote on April 7th on bylaws to issue debentures for the following: $5,000 20-year six per cent., for the purpose of obtaining a supply of water for household and fire protection purposes; $1,500, 10 years, six per cent., for street improvements, and $5,000 six per cent. 20-years, to build a town hall.

Winnipeg, Man.

Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until April 1st for hardware supplies, black iron pipe and fittings, galvanized goods and rubber goods required for 1909. Specifications at office of City Storekeeper. Mr. Peterson will also receive tenders until April 2nd for supply of from 8,000 to 10,000 cubic yards of clean, sharp grained sand, f.o.b. cars, city asphalt plant. Specifications at office of City Engineer Ruttan.

AWARDED.

Winnipeg, Man.

The Northern Electric and Manufacturing Company have been awarded the contract for a pump and motor for well No. 7, at $11,000.

Ottawa, Ont.

The Department of Public Works has awarded the contract for the construction of the dam at the foot of Lake Temiskaming to Kirby and Stewart, of Ottawa. The contract price is in the neighborhood of $108,000 and work will be started at an early date.

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A Few Reforms Which Would Bring About Greater Harmony

So long as the present methods of tendering are in vogue, so long will there be complaints from both architects and builders. It seems, though, that at present the builders are entitled to make the greater call for reform. Any mistake or omission on the part of the architect always directly affects the contractor and it is he who is the more direct sufferer. The causes for reform are legion, according to the average builder. If these causes are carefully considered, however, it will be found that in several instances the contractor is talking from a sound standpoint.

One often hears that plans and specifications are not prepared in a sufficiently clear and definite manner. Now the architect should place himself in the contractor's position and not pre-suppose that what is clear to him, the architect, who has naturally acquired much familiarity with all the details in connection with the building, is equally apparent to the builder, who knows nothing whatever of the work until he sees the sketches. There are many architects, of course, whose work is all that can be desired. The reputation of such is established throughout the whole of the building community. Unhappily, however, such men are only too few, in proportion to the others included in the ranks of the architectural profession. It would seem that the clearer definition of plans is more a matter of individual effort. The fact is that in many cases sufficient time is not spent by the architect in making his plans and specifications complete. Where this is so, how can the builder be expected, in the limited time at his disposal, to master that work which has often taken the designer many months? In justice to the trade, if not to the owner, every assistance should be given to the builder. Nothing should be left open to speculation. The specifications should not be involved in any way, but should be clear, definite and complete. Large size scale drawings should be furnished on many jobs, so that the contractor may know what to expect for interior work and for any special features on the exterior. It is often urged that full size details should be prepared, but as a general rule this would be unfair to the architects, as very few jobs are carried out exactly as planned.

A clause in the specifications, from which sometimes arises misunderstanding and inconvenience, is that relating to the delivery of material. It has been pointed out that in specifications for a recent work of considerable importance it was omitted to say whether the material required was to be delivered at the city yards or on the job. Often tenders will be called within a very limited period. If the contractor does not happen to be a local man and, when he gets the information concerning the tender, instructions as to the place of delivery are not provided, he has the choice of coming to the wrong conclusion, figuring too low and being out of pocket, figuring too high and losing the job, or not figuring at all. This, of course, is a grievance of the supply man, but it nevertheless comes within the province of the subject.

The above consideration suggests a further point, namely, that details are often not furnished in sufficient time to enable the contractor to secure proper estimates on the various portions of his work. If contractors would only realize it, the remedy lies with themselves. They should insist upon having time enough to figure carefully upon the plans before putting in their estimates. Also, in justice to architects and to their fellow-contractors, after obtaining a reasonable allowance of time, they should prepare their bids and return the plans promptly.

In their superintendence of work, architects are apparently unreasonable at times. For trivial causes, which might be smoothed over in some other way, they demand changes entailing considerable expense. Architects and builders are so closely allied that ready co-operation and mutual consideration are at all times essential. When changes are rendered necessary the contractor should not only be carefully considered but primarily consulted. He should always be a factor of the greatest importance, apart from the bare obligations of his contract.

These are a few points which not a few architects and builders might profitably consider. The time will never come when all complaints and grievances will be entirely eliminated, but with studied co-operation and mutual regard, the time may come when the bug-bears of the business will be effectively removed and architects and contractors will work together in greater harmony.

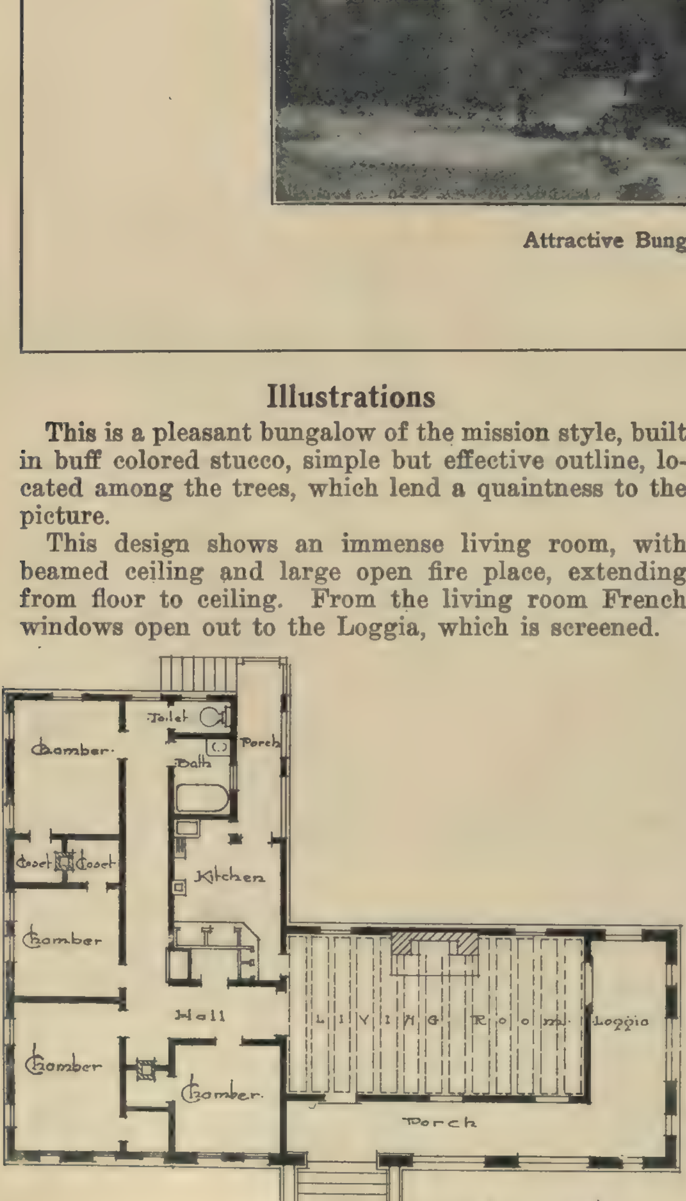
An Innovation in Bungalow Construction

Attractive Bungalow—Mission Style.

Illustrations

This is a pleasant bungalow of the mission style, built in buff colored stucco, simple but effective outline, located among the trees, which lend a quaintness to the picture.

This design shows an immense living room, with beamed ceiling and large open fire place, extending from floor to ceiling. From the living room French windows open out to the Loggia, which is screened.



Floor-Plan

There are four small bedrooms, with ample closet room, kitchen, bath, toilet and porch.

The entire scheme is a novel one, and a departure from the generally accepted type of bungalow buildings

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Enthusiasm is the power that drives our mental machinery. It is the force that brings things to pass. Lack of it may be the one thing that holds you back from the fullest success in life.

Details and Costs of Fireproof Construction

The subject of fireproof building is just in its infancy, said J. E. Mecusker, Warren, Pa., in a recent paper before the National Brick Manufacturers' Association annual convention. While architects are recognizing the desirability of the use of hollow clay tile for that purpose in public buildings and in our modern skyscrapers, they do not seem to have given its use in private house construction the consideration the subject demands. Where the owner is building a house for his own use, they do not seem to have taken into consideration the possibility of this form of construction, especially from the important points of both fire and sanitation. This form of construction being absolutely vermin, fire and souid proof, and of very little more expense than the usual form of wood construction. As to cost, I will treat on that later.

There is another point in favor of this form of construction, especially in its use in partitions, and that is making heat conductors or pipes out of ordinary partitions by setting the tile, where the heating pipes come directly over each other. A flue or heating pipe can be formed in this way that is better in every way than tin and, at the same time, forms the partition as well. I have done this myself, and know whereof I speak.

Partition tile should be set on end, as the tile have a greater strength set that way. In my own house the main partition, built of four-inch tile, carries the second floor joist, setting on a brick wall in the basement. The pipes from the furnace enter the wall through a thimble, the same as used for chimneys. Then where the register on the second floor comes, in the partition above the baseboard (as they all do), a tin pipe connects the tile with the register. Should the lower partition come directly under the upper, no tin would be required. Special tile could be made for this purpose, and do away with the tin entirely.

A very little thought on this line will easily demon strate to the average manufacturer of fireproofing how easily all this can be accomplished.

In my house, which, by the way, is only a small insignificant affair, the saving of tin pipes was $25, and the pipes are indestructible. Now you will understand that this applies only to houses using hot air furnaces.

Now as to cost. We will take a small cottage of eight rooms and bath, with outside dimensions of 28x32 feet, using a six-foot span of arch. A flat arch of six-inch tile is thick enough for residence construction. An arch of this thickness of good tile will carry a dead load of 600 pounds per square foot. The usual load requirement is 75 pounds per square foot. There would be required ten six-inch "I" beams, 27 feet long, the centre resting on a brick wall in the cellar, ends on outside walls. These would weigh twelve and one-fourth pounds per foot, and cost about $2.60 per hundred. Four angle irons, same length, costing about $10, about 150 feet ¾-inch tie rods, costing about $15, or a total cost for steel of $110. In both floors, 1,560 square feet of six-inch arch set in floor at ten cents per square foot, or $156 for tile. About four cubic yards of cinder concrete, at $3.50 per cubic yard, to hold floor strips, costing about $14, making a total cost for the steel, tile and concrete, complete, of $280.

On lower floors, where the partitions in part carry the weight of the upper floor, and also the heating flues, six-inch tile should be used. For partitions on upper floors two or three-inch tile are heavy enough. All partitions should be of porous terra cotta, so that they can be nailed readily, saving plugging the walls for casings, picture mouldings and baseboards.

The cost of partitions exceeds studdings and lath but very little, if any.

Where electric wires are installed, they, as well as all pipings, can be run in the partition tile.

These figures given here can be easily verified, and, while in different localities may vary some, will prove approximately correct. With the very small additional cost, would not most all of our home builders use this form of construction? Especially when one takes into consideration the fact that it is absolutely vermin, sound and fire proof.

The time has come when the price of all wood makes its use very expensive, and building must be done with some other material. What building material is there, both from durability and artistic points of view, that fills the requirements like burned clays? The manufacturer of burned clays, as well as the prospective users thereof, hardly realizes the cheapness, as well as the many other points of superiority they possess, and the great additional market their use in home building would make possible were people educated more fully to their use.

The average prospective builder seems to think a brick house is about the most expensive construction one can start on. And should one talk fireproof construction he would be ready to throw over the whole proposition. It will take a long time, and lots of missionary work, to educate the public to this form of building, but come it must, and the sooner the better for our craft.

The subject of cheap fireproof home construction has become of such moment that it has brought forth the best thought of some of the most learned men of our time. When such men as Thomas A. Edison give a subject their thought it certainly deserves consideration. But Mr. Edison has designed and patented a fireproof house, and a company has already been organized to develop his plans of fireproof residence construction. And, while not of burned clay, it seems to be worthy of clayworker certainly has one of the oldest, as well as the best of materials for the purpose, and the only requirements to advance its use are a proper application, as well as the educating of both the erecting contractor and the prospective builder.

The New Secretary of the Toronto Builders' Exchange

Mr. P. Lyndon Fraser, who was recently appointed secretary of the Toronto Builders' Exchange, is a native of Winchester, Ont. While his experience does not appear to have been particularly extended, which, on account of his youth, is easily understood, his training is one that pre-eminently fits him for his new duties. For some time he was connected with the Employers' Association as assistant secretary. Previously to this he was engaged in the sales department of the Copeland-Chatterson Company, Limited, Business Systems, Toronto. Mr. Fraser only entered upon his duties at the local exchange at the beginning of the month, but he has already created a most favorable impression. There is an abundant sphere of usefulness in the Toronto Exchange for Mr. Fraser. He is young, of a cheerful and engaging personality and possesses that indefinable quality which at once wins regard. There is every indication that he is the right man in the right place.

Mr. P. L. Fraser.

Errors in Paving Construction

More errors are made in filling the joints of brick pavements than in any other part of the work. Nothing but cement filler should be allowed. Before it is applied. the brick should be wet down with a fine spray of water The filler should be of Portland cement, 1:1 in the first course and 2:1 in the last course. After making sure that the sand is thoroughly dry, sand and cement should be mixed dry and thoroughly before water is added. The author described the special mixing-box designed to ensure a good grout. This box should be mention here, showing the trend of the times. The kept close to the joints being filled.

Reinforced Concrete in Building Construction

A Review of the Uses of This Material
by Emile J. Perrot, of Philadelphia

One of the most interesting addresses delivered at the recent convention of the Canadian Cement & Concrete Association was the following, on "Reinforced Concrete in Building Construction," by Emile G. Perrot, A.A. I.A., Asso. Mem. A.S.C.E., of Philadelphia:

The principal of reinforced concrete construction as used for supporting members of buildings, is based on the following facts:

Every simple beam, loaded either uniformly over its length or concentrated at any point thereof, is in compression at the top and in tension at the bottom. By using steel roads of the proper area and at the proper location to resist the tensile stresses, and arranging the concrete so as to resist the compression, the beam will be in equilibrium. As the resistance of concrete in compression is so much greater than it is in tension, the latter being of a low value, no depednence is placed upon the concrete to resist the tensile forces, sufficient area of steel being introduced to resist these strains. The force of adhesion between the concrete and the steel is, however, sufficient to transmit the internal stresses across the section of the beam; so that the fundamental principle of the theory of the beam is applicable to this system of construction the same as to a beam composed of a homogenous material.

The early use of reinforced concrete was for tanks, reservoirs, pipes, bridges and like structures, and the application to buildings was gradual, first being used in connection with rolled beams as a filling or slab. This was the manner in which the Monier system was first employed in France. As the use of the material became more general, reinforced concrete beams, as well as slabs, were used. Then reinforced concrete columns were introduced, and finally whole buildings were constructed of this material.

As the possibility of making an economical and thoroughly fireproof structure in reinforced concrete became evident, progressive manufacturers seized the opportunity to erect buildings of this material. In Europe manufactories were erected in which the entire structural members were of reinforced concrete, the walls being brick paned or filled in between the columns with brick spandrels and windows. This construction is used to this day, and makes a very economical method of building.

The next step to brick paning was to make the entire exterior of concrete, omitting the brickwork entirely. This is done by constructing the walls with columns under the girders and filling in between with a lighter construction of concrete, or making the entire wall one thickness, in the same manner as it is usual to build a brick wall. Of course, numerous variations of these several main methods of construction have been employed, and, as the art progresses, we find some interesting combinations of construction which were not dreamed of in the early days. We even have Edison, the wizard of Menlo Park, startling the world with his 24 hours' concrete house made in cast iron moulds.

One of the common methods of using concrete in the United States is to build the exterior and bearing walls of brick, and to make the interior columns, girders, beams and slabs of reinforced concrete. Of late buildings constructed entirely of reinforced concrete have become very common, but as the manner of finishing the exterior concrete is in a rather unsettled condition, some persons prefer to use brick walls, simply using the concrete in lieu of what would ordinarily be built in wood, or possibly steel and terra cotta. One of the most satisfactory ways of using reinforced concrete is to make a concrete cage similar to a steel cage and surround the cage with brick or terra cotta.

Where brick walls are not desired, reinforced concrete wall columns make an ideal method of construction, as there is in this system the least amount of concrete poured as part of the monolith, thus reducing the danger from errors showing in the finished work. The paning and filling between columns can be done after the forms are removed from the wall columns, and with a different material if so desired; solid plaster partitions or wire lath and channel iron studs can be used if desired. This cheapens the construction of the walls to a considerable extent, as the costly item of concrete walls is usually the forms. In order to present a respectable appearance, the forms must be accurately and neatly made, and this feature usually adds to the cost.

Continuous walls of concrete are usually used where an abundance of light is not desired and the openings are few; in this case the thickness of the wall can be materially reduced from that usual in brick. The Philadelphia building regulations permit reinforced concrete walls to be made two-thirds the thickness of brick. Concrete blocks used for piers make an excellent construction, provided the voids in the blocks are filled solid with cement grout and steel rods and ties introduced.

Reinforced Concrete Beams.

As reinforced concrete beams became more and more popular, various attempts were made to introduce systems of floor construction that would be different from those in previous use. As most of the systems were patented, it was necessary to deviate from what had been done heretofore. This has led to a number of modifications in building floors, which, while appearing on the surface to be radically different from each other, can be classed under three main divisions, varying from each other in some fundamental.

The first group consists of loose bar systems in which the reinforcing elements are separate bars or rods, whether plain or deformed.

The second group consists of built-up frames making a number of bars into a unit and placing them in the mould as such.

The third group consists of moulding the beams and girders in advance on the ground, permitting them to harden and then erecting them in much the same manner as steel or wooden beams are erected. This last system has not been very widely employed The Edison Portland Cement Company have used this system in a building built for themselves. They call the system "Separately Moulded Members."

It is seen that the shape of the bar in the above classification does not influence the grouping of the system. It is the writer's belief that the use of the word "system" has been abused by being applied to a form of bars instead of to a method of applying bars for the purpose of reinforced concrete.

Each of the above classes or groups can be subdivided into variations from the general type; also, there are combinations of structural steel shapes with concrete which could be classed in a separate group, but it was thought best not to confuse strictly reinforced concrete systems with any combination of the two.

European and American Practice.

The use of plain bars for reinforcing concrete seems to have found favor in Europe to the exclusion of almost any other type, principally on account of the universal rolling of round and square rods, which make them more readily obtainable and in general answer the purpose. Their use, in the writer's opinion, should be restricted to work where the loads are quiescent, as there is danger of the bond between the concrete and steel being broken if the construction is subjected to shocks. In important members, hook ends should be used on the bars to assist in preventing slipping of the bars; also, when plain bars are used, they should lap much further than if deformed bars are used.

In the United States, practice seems to favor the use of deformed bars. There are a number of of patented bars on the market calculated to increase the bond between the steel and the concrete. In figuring the area of these bars, net sections should only be considered, as it is very seldom that the projections add to the area of the bars. Cold twisted square bars are much used and constitute one of the best forms of bars. High carbon steel made from original billets are being used for reinforced concrete, and if deformed make excellent reinforcing bars, but on account of their brittleness should only be used in sizes of one inch and under and where sharp bends occur, they should be made hot. The trussed or Kahn bar has the double feature of being a deformed bar, as well as providing some stirrup for the web reinforcement of the beam.

The use of expanded metal and a webbing or fabric consisting of main wires and secondary wires at right angles to the principal ones is, in effect, the use of deformed bars, the differences being that there are a number of them assembled together. In girder frames with the stirrups shrunk on or otherwise rigidly attached to the main bars, the adhesion is so much increased as to bring this type under the head of deformed bars.

The use of cables for reinforcing beams and girders is not considered practical, although there is one system on the market which advocates its use. The writer cannot see any advantage gained in the use of cables for beams and girders, and decided disadvantage is apparent, as the cable to be effective should be drawn up tight, which is not practicable in beam and girder construction. For slabs in connection with a webbing, cables may be successfully used, but they will be of little value unless drawn up taut.

We have seen how reinforced concrete is applied to walls and floors. We will review briefly its use in connection with the various adjuncts of a building, such as stairs, chimneys, footings, partitions, reservoirs, etc., also the various methods adopted for waterproofing concrete.

The practice of making stairs of incombustible materials, even in non-fireproof buildings, is not new; the use of cast iron strings, horses and risers with slate or marble treads is very common. Hence, it is only natural that in fireproof concrete buildings the same precaution should be taken, and as a matter of fact, we find a ready application of reinforced concrete to stairs.

In buildings of the factory type, the stairs are usually enclosed by a wall or fireproof partition and sometimes the stairs are of the return type, having two runs between stories, with a half-pace or landing. If this is the case, each run forms an element for treatment by itself, having the header beams carried on the enclosing walls, which are usually constructed at the time the stairs are built, if the walls are of concrete. If the enclosing walls are of brick, the stairs may be built first and the brick walls around the stairs, afterwards supported on the concrete floor and columns.

However, the building of the brick wall first, leaving pockets for the ends of the beams and slabs where half-paces and landings occur, is to be preferred, as then the concrete can be made to flow into the pockets and grooves left in the brickwork, thus solidly filling the entire space; while if the walls are built after the stairs are constructed, underpinning the ends of beams and slab is necessary to secure a firm job. The usual method of building the stairs of the type mentioned is to consider one run or flight as an inclined slab having the step cast thereon, resting at the top and bottom of the runs on beams or headers. This involves only a simple calculation to determine the thickness of the concrete under the step and the size of the reinforcing steel.

Sometimes, by reason of there being a large well in the corner stairs and consequently no means of supporting the interior corner of the quarter-space or landing, it is necessary to run a string around the wall of the stairs. This string acts as a beam and is heavily reinforced. Sometimes in double threaded stairs in which there are two flights or runs over each other to the storey, in order to save head room no header beam is used, but the stairs are carried on the side walls, having the main reinforcing steel running parallel to each riser in the bottom of the soffit

If no special finish is desired, the treads and risers are finished wits a 1 to 2 cement and sand top coat, the same as for sidewalks. The edge of the step and soffit of the stairs are finished smooth with a cement coat brushed on, unless the stairway is plastered, then the soffits and edges are plastered with the rest of the work. If a rich finish is used, the rough concrete stairs can be covered with marble treads and risers with an ornamental balustrade to match.

Reinforced Concrete Chimneys.

Much discussion has been given in the technical press to the construction of reinforced concrete chimneys. This has been brought about largely owing to the fact that some of them have collapsed. My own experience in this matter is that while reinforced concrete chimneys can be, and are, constructed on perfectly safe lines, there does not seem to be the same necessity to use concrete for this part of a building, since there are other materials possibly better adapted for this purpose than reinforced concrete. I refer to the hollow tile chimney. However, if it is desired to use a reinforced concrete chimney so that the exterior effect of the building as a whole will not be destroyed by using two dissimilar materials on one operation, a strictly safe and durable chimney can be constructed of reinforced concrete.

In designing such a chimney, it should be borne in mind that an inner shell or lining built separate and distinct from the outside or supporting shell, is necessary. This need not extend the entire height of the chimney. Furthermore, it should be constructed so that any needed repairs can be made to this inner shell without in any way affecting the main outer shell.

(To be Continued.)

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

A Review of Heating Systems

By Chas. L. Hubbard.

The object of this article is to present in concise form some of the more important advantages and disadvantages of the three systems of heating in most common use—that is, furnace, steam and hot water.

The idea is to first assist the engineer or contractor in making a selection of the best system for the case in hand and then present the matter to his prospective customer and answer the more common objections which are likely to be raised.

Each system will be taken up separately, giving first a brief review of its advantages, followed by its objectionable points, and showing how to overcome these so far as possible.

Either of the three systems, when adapted to the conditions and properly designed and installed, should give about equally good results, so that the reader, whatever his special system of heating, may conscientiously use the following arguments, provided they are properly applied.

Furnace Heating.

Hot air furnaces are the lowest in cost and to some extent the simplest to operate. They furnish a supply of fresh air to the rooms as well as heat, which is especially desirable in living rooms. They heat up more quickly in the morning than either steam or hot water, because as soon as any heat is generated it passes to the rooms above through the flues and registers. In the case of steam a pressure must first be produced, after which the pipes and radiators must become hot before any heat can be given off for warming the rooms. A hot water system requires a still longer time for warming up, as the large body of water contained in the system requires a correspondingly large amount of heat for raising it to an effective temperature.

In the case of steam, as soon as the pressure goes down the radiators cool off, while with a furnace a low fire will still furnish warm air to the rooms, but at a lower temperature. Another important advantage which the furnace has in cold climates is that heat may be shut off from unused rooms or the fire be allowed to go out in closed houses without danger of freezing. This is an important point when compared with hot water. Again, the only part of a furnace system which requires repairing is easily accessible, which is not the case with steam or hot water, where supply and return pipes are run in concealed positions. Among the objections commonly raised to furnace heating may be mentioned dryness of air in the rooms, the entrance of gas and ashes through warm-air registers, inability to heat certain rooms in the morning or during high winds and greater expense for fuel, as cold outside air has to be warmed up to 70 degrees before it can become a medium for carrying heat to the rooms.

These objections may be answered as follows, if the contractor is a furnace man and desires to do so. Advocates of steam and hot-water heating would undoubtedly prefer to let them stand.

Dryness of air can be avoided by using a furnace of such size that extremely high temperatures of entering air are not necessary for warming, and by keeping the water pan, with which all the best makes of furnaces are provided, filled with water at all times.

While it is true that the furnace and rooms are more directly connected than in the case of steam or hot water, it does not follow that trouble from gas and dust should be much greater in one case than in another. In any first-class furnace the joints between the smoke passages and the air-ways should be made air and dust tight, and after this is done a proper use of dust and smoke dampers should prevent any objectionable escape of these substances into the rooms above.

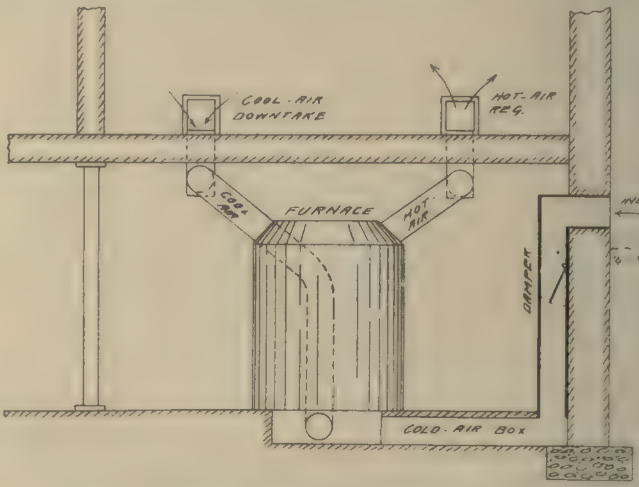


Fig. 1.—General Method of Arranging a Return Flue in Furnace Heating.

If either gas or ashes escape into the cellar, they are bound to pass into the rooms above to some extent, regardless of whether they come from a hot air furnace or a steam boiler.

A more positive flow of warm air to all of the rooms in windy weather can be secured by so locating the furnace that the hot air pipes running to northerly and westerly rooms shall be shorter than the others, and the results may be still further improved by making these pipes of larger size and giving them an upward pitch. Dampers should be placed in the pipes, so that those leading to the most favored rooms may be throttled and the air forced into the others. Especially exposed and important rooms should be provided with return cold-air flues for air-rotation in cold and windy weather. The common objection that ventilation is destroyed by this means may be met with the statement that under these conditions the fresh air is taken in around windows and through walls instead of by the usual manner through the cold-air box. Only the method and not the results are changed

Fig. 1 shows the general method of arranging a return flue in furnace heating. The cool-air downtake is best placed upon the same side of the room as the hot air register, and should connect with the cold-air box or space beneath the furnace, as shown.

This is for use only when the rooms fail to heat properly, on account of winds which tend to prevent the hot air from entering in sufficient volume. At other times the return register should be closed and the entire air supply taken from out of doors.

Good results may also be obtained by the use of a small electric fan placed in the cold-air box for use when occasion requires.

Fig. 2 illustrates the use of a small electric fan for rotating the air through a furnace system for quick warming in the morning or for use when certain rooms fail to heat properly under adverse wind conditions. In the arrangement shown, the fan is to be used for rotation only, the return air being taken from a hallway or other central location into which the doors from other rooms open. The switch damper is for shutting off the duct leading to the fan when not in use.

It is true that more fuel is required for warming a house in cold weather by means of a furnace than with steam, but, on the other hand, the amount burned during the entire season will not vary so greatly, as during the mild weather of fall and spring a furnace may be so run as to give just the amount of heat required, while with steam it is practically impossible to do this, and much heat is lost through the open doors and windows of overheated rooms.

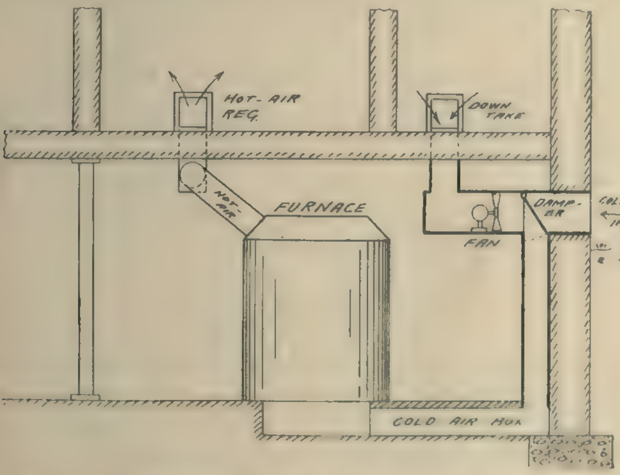


Fig. 2.—Illustrating Use of Electric Fan for Quick Warming.

Again, it must be borne in mind that ventilation cannot be secured in the winter time without paying for it, whether the air be warmed by a furnace or by steam or water. Furnaces are especially adapted to the warming of dwelling houses and also stores, churches, halls and schoolhouses of small size.

Steam Heating.

Steam heating includes both the direct and indirect systems. Direct steam is widely used in all classes of buildings both by itself and in combination with the indirect system. It costs more to install than a furnace, but requires less fuel if properly managed. In rooms which are not crowded, such as stair halls, corridors, etc., there is usually sufficient inleakage of fresh air for the necessary ventilation. This may be taken as one change per hour of the entire contents of the room in the average building. Rooms of the kind mentioned are much more easily reached by steam pipes than by hot air flues, and the action of the radiators is sure, when properly installed, regardless of the direction or strength of the wind. Sleeping rooms are comfortably heated by direct steam, as the inleakage of air is sufficient during the day and ventilation by open windows at night is commonly practised at the present time. For living rooms and others where ventilation is desired, indirect stacks may be used. The advantage of indirect steam over furnace heating comes from the fact that the stacks may be placed at or near the bases of the flues leading to the different rooms, thus doing away with long horizontal runs of pipe and avoiding to a large extent the effect of wind pressure upon exposed rooms.

Indirect and direct heating may be combined to advantage by using the former for the more important rooms where ventilation is desired, and placing direct radiators in rooms which are more remote or where heat only is required. Another advantage is the large ratio between the radiating surface and the grate area, as compared with a furnace; this results in a large volume of air being warmed to a moderate temperature instead of a smaller quantity being heated to a much higher temperature, thus giving a more agreeable quality to the air and rendering it less dry.

As compared with hot water, steam has the advantage that unused rooms may be shut off without danger of freezing in the pipes or radiators, and if the house is to be closed, it is a simple matter to drain the water out of the boiler; while in the case of hot water the entire system of pipes and radiators must be drained also.

Steam is adapted to a greater variety of buildings and is more widely used than any other system. When compared with furnace heating in buildings of such size as to require two or more furnaces, it has a decided advantage, as a single boiler may be made to do the entire work and is much more convenient to care for than several fires in different parts of the building.

Among the disadvantages commonly mentioned are difficulty of temperature regulation in mild weather, inaccessibility of pipes in case repairs are necessary, snapping or water-hammer in the pipes, backing up of water into the radiators and flooding of floors through air valves, spitting or leaking of automatic air valves, unsightly appearance of direct radiators in rooms, and danger from boiler explosions.

Taking these up in order, we may say that a certain amount of temperature regulation may be secured in various ways. If the system is tight and vacuum air valves used, the system may be run on a vapor below atmospheric pressure in mild weather, thus securing to some extent the action of hot water heating. Again, the radiators may be turned on in the morning and the house warmed up, after which they may be shut off, with the exception of two or three of the more important ones, say, those in the halls and living room, and by opening doors into hallways the temperature of the various rooms will equalize to a considerable extent. This is, in effect, treating the occupied portion of the house as a single room with several radiators, and turning on just enough of these to produce the right temperature. When indirect stacks are used temperature regulation can be secured by partially closing the registers, or, better, by the use of mixing dampers which do not interfere with the volume of air supplied to the room.

Difficulty from leaks in concealed piping can be avoided by keeping the risers and radiator connections out of partitions and floors. By a little study the risers to the upper floors can usually be carried up in closets, hallways and inconspicuous corners of other rooms. A riser erected in a true vertical position and painted to correspond with the woodwork or walls of the room is not unsightly, especially if the plastering is unbroken and the ceiling and floor plates are neatly attached and fit the pipe properly.

No system of steam heating in which the piping is correctly installed should give trouble by persistent water-hammer.

When steam is first turned into a cold radiator there is often more or less snapping, due to the exceedingly rapid condensation which occurs at that time, but if the piping is of sufficient size, properly graded and without pockets or short-circuits, all noise should stop as soon as the radiator becomes warm or even partially warm.

A slight pitch of the pipe in the wrong direction toward the foot of the riser is often sufficient to cause the condensation to be caught by the current of steam and carried back into the radiator or riser, where it produces a constant boiling and snapping. As the water collects it increases the condensation at this point, thus reducing the pressure slightly and tending to hold back the return water still more. This can be easily corrected by giving the connecting pipe a sharp pitch toward the steam main.

Damage to floors and ceilings by flooding of the radiator, with consequent leakage through an open air valve, is nearly always caused by carelessness in opening the return valve only, thus allowing the water to back up from the return mains in the basement.

The remedy for this in case of a two-pipe job is to make it a rule to always open the steam valve first when turning on steam, and to close it last when shutting off steam.

A surer way is to employ the one-pipe system in houses where difficulty is likely to occur. This system when properly installed operates perfectly, and, as there is only one connection and valve, the difficulty referred to cannot occur. Again, with this system of piping there are only one-half as many risers to pass through the first floor rooms.

Spitting of air valves when freeing the radiator of air often causes considerable annoyance. This rarely occurs to any extent in radiators which drain freely, and can usually be entirely avoided by having the stem of the air valve sufficiently long to project some little distance beyond the inner wall of the radiator section, or by the use of metal "drainage strips" projecting from the entrance to the valve, such as are used in some of the leading makes of automatic valves.

Dripping of the valves can be entirely avoided by connecting the outlets with a drip-line of piping and carrying the same to a basement sink.

There is no necessity for the unsightly appearance which the vividly bronzed radiator often has in a handsomely decorated room. The decoration of the radiators should come under the direction of the architect and should form a part of the color scheme of the room. This work should be done by the painters and not by a steamfitter's helper, as is often the case. A radiator is an object of utility, and when properly finished should be no more objectionable than a fireplace or bookcase.

The item of danger by explosion is not usually brought up, but occasionally a prospective customer raises the question. Personally, the writer has never known of any damage being done by the explosion of a low-pressure cast iron boiler. They are made heavy for the pressure carried, contain but a comparatively small amount of water, and, being in most cases of the sectional type, practically no damage ever results from a cracked section, except the inconvenience and expense of having it replaced.

Hot Water Heating.

Hot water is especially adapted to the warming of dwellings and greenhouses, owing to the ease with which the temperature can be regulated. A low or moderate fire can be carried in mild weather the same as with a furnace, thus having the advantage of regulation and economy of operation over steam. In cold weather the water can be carried at a higher temperature and the effect of steam heat obtained if the radiators are properly proportioned.

The two points mentioned above are the principal advantages of water over steam, and the advantages of water over a furnace are practically the same as those of steam.

The principal objections to hot water are higher first cost, due to larger radiators, and danger of freezing in unoccupied rooms where the radiators are shut off. The first of these is practically offset by greater economy of operation, due to the fact that the temperature of the water need only be sufficient to meet the requirements at any time during the heating season, as already stated. Danger of freezing in the radiators may be practically avoided by drilling a small hole, about one-eighth inch in diameter, through the valve-plug or gate, so that when closed there will still be a very slow circulation through the radiator, thus preventing the temperature of the water from approaching the freezing point. The objections relating to leaks in pipes in inaccessible places and the unsightly effect of improperly decorated radiators are sufficiently discussed under steam heat. It is true that a hot water system requires a greater length of time for warming up than either a furnace or steam. On the other hand, the temperature of a house heated with hot water does not fluctuate so readily as when either of the other two systems are used, because the large body of heated water contained in the system acts as a regulator or "balance wheel." The proper and most economical way is to run as even a fire as possible day and night, and not allow the house to become cold. The forcing of a fire for an hour or two in the morning for warming up the house takes practically as much fuel as to carry a moderate fire during the night, to say nothing of the added comfort secured by the latter method.

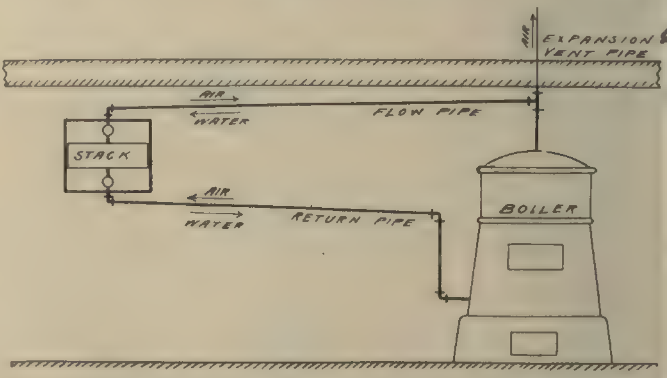


Fig. 3.—Showing a Good Way to Make the Connections with an Indirect Hot Water Stack to Prevent Air Binding.

One of the difficulties often experienced in hot water heating is an inequality of flow in different parts of the system, thus causing some radiators to be only slightly warm, or even cool, while others are hot. The two principal causes of this condition are the pocketing of air in pipes and radiators, and short-circuiting, due to improper piping. If the greater part of the air can be removed as it rises from the boiler, and before it enters the system of piping, it is certainly a long step in the right direction.

The main vertical flow pipe from the top of the boiler ends in a plugged tee, from the top of which a pipe is carried to an open expansion tank in the attic. This pipe acts both as an air vent and expansion pipe. It is connected inside the main valve, so it can never be shut off. The flow main leading to the radiators is taken from the side of the tee. As most of the air is liberated in the boiler, and being lighter than the water, it rises at once to the highest point, which is the top of the vertical pipe over the boiler. From here it rises to the expansion tank, from which it escapes through the vent.

Fig. 8 shows in diagram a good way to make the connections with an indirect hot water stack to prevent air binding. Here a vent pipe is carried directly to the expansion tank for removing the greater part of the air. In addition to this, the supply or flow pipe, pitches downward toward the stack, and the return pitches downward toward the boiler. As any air contained in the system tends to work its way toward the highest points, it is evident that any air liberated in the pipes or stack will find its way to the tee over the boiler, as indicated by the arrows, and from here will escape to the expansion tank.

In order to prevent short-circuiting, care must be taken to proportion the resistance to the force as much as possible. For example, radiators upon the upper floors tend to circulate more strongly on account of their greater elevation, hence when a lower floor radiator and an upper floor radiator are supplied from the same branch, the conections should be such as to favor the lower floor.

In the same way, radiators near the boiler tend to circulate more rapidly, owing to the higher temperature of the water at this point. This can be overcome to some extent by taking the supply branches to these from the side of the pipe instead of the top.

Sewerage Disposal in England

In view of the increased attention which the subject of sewage disposal is being given by Canadian engineers, a condensed description of a modern sewage disposal works recently opened at Burslem, England, may be of interest. The estimated population of the borough is 40,000, and the area 1,862 acres. The liquid trade refuse from the Potteries is admitted into the sewerage system without previous treatment, but is of such a character as may be disregarded, the sewage being almost entirely that from domestic premises. The sewage is delivered to the works by means of two main gravitating sewers, each three feet in diameter, draining the high level and the low level. The greater part of the town, however, is drained by the high-level sewer, the lower-level sewer dealing only with the sewage from a population of about 9,000. The sewage has hitherto been dealt with on a farm by the broad irrigation method; but this treatment of the sewage has now been entirely abandoned, and the farm given up.

The new works have been designed so that three times the dry-weather flow (800,000 gallons per day) is passed through the catchpits, detritus tanks, septic tanks, and from the septic tanks is pumped to a height of about 40 feet to be dealt with by the percolating filters, the effluent then finally passing into the Foulea Brook adjoining. No provision is made for treating the effluent on the land adjoining. The sewage from the high-level sewer gravitates through screens to the catchpits, two in number, each 20 feet by 11 feet by 10 feet deep. The sewage from the low-level sewer, however, has to be pumped from a small receiving tank, 9 feet in diameter by 18 feet deep, to the screens. The walls of the catchpits are built of blue bricks in cement, the floor being formed of Portland cement concrete.

The detritus tanks are two in number and circular in form, each 25 feet in diameter and 10 feet 6 inches deep. The walls and floors of the detritus tanks are built of blue bricks and concrete. The two existing storage tanks, having a combined capacity of 900,000 gallons, have been converted into two septic tanks. The sewage passes from the detritus tanks by means of a 24-inch cast iron main to a chamber which is filled with penstocks, so that the sewage may be turned into the septic tanks as desired. From the septic tanks the sewage passes to the old sump-well under the existing engine house, from which it is pumped through a 21-inch cast iron rising main to the distributing chambers placed above the percolating filters. When completed, the filters, which are circular in form, will be twenty in number, each 100 feet in diameter and 5 feet in depth, with a combined area of 17,450 square yards. These are arranged in two tiers of ten each. The walls are constructed of blue bricks in cement, and the floors are formed of Portland cement concrete, 12 inches thick, finished to a smooth surface.

No floor tiles are used, and the surface of the concrete has a fall of 6 inches towards the outlet channels. The works when complete will cost $200,000.

Interesting Legal Decisions

Closing a Road Allowance.—The case of Pirie & Stone v. Parry Sound Lumber Company, which arose over a question of ejectment, was recently heard in the Court of Appeal. It had already been tried before Judge Riddell, and the question involved was one relating to the closing of an impracticable road allowance by the municipality. The Court held, that to rip up the whole matter now would be to unsettle titles and occupants all along that part of the Sequin River and Mill Lake, and to disturb the whole long-settled state of affairs based upon the action of the municipal council. Accordingly the appeal was dismissed.

Injury to a Neighboring Building. The case of Ayerhart v. Weinstein which recently came up before Chief Justice Falconbridge involved an action for damages for injury to the plaintiff's house by raising an adjoining building. The defendant had made a contract with one Litowitz to raise the extension of his house for a definite sum. It appeared that some trifling injury might have been caused to the plaintiff's building by the joint action of the use by Litowitz of the jack screw, etc., and by the excavation done by the plaintiff himself under his own building. Judge Falconbridge held that it was clear that the plaintiff had no right of action against the defendant. It would have availed him very little if he had established such right, for the damages would not amount to $20, and there would have been no certificate assisting plaintiff in the matter of costs. There was no intrusion, pressure, or impact of defendant's house against plaintiff's house which would entitle the plaintiff to an injunction. The action was therefore dismissed

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

The Road Surface

The following paper was read at the recent annual convention of Ontario Land Surveyors, by Mr. W. A. McLean, Chief of the Roadways branch of the Department of Public Works for Ontario:

Country highways of Ontario are every year increasing in importance. Without good roads, efforts to improve homes and farms, commercial and social conditions throughout the province, will be largely nullified. As feeders of and distributors from the railways, country roads are of great importance to towns and cities. Important as country roads were before the advent of the steam railway, the extension of steam railways has greatly increased their value, for steam railways mean development; and that development if it means anything, implies the necessity of good country roads.

The road and the vehicle are part of one machine, just as the efficiency of the steam engine is dependent upon steel rails and the roadbed. With the coming of cheap motor vehicles, a new era in the use of roads is dawning, and to reap the benefit, country roads must be equal to their new acquaintance—the horseless vehicle. Ontario roads are not yet in keeping with the horse-drawn vehicle. While it may seem impracticable to aim at serving a higher class of traffic, it can only be neglected to our own loss.

Problems of road construction involve a considerable degree of skill in dealing with drainage, grades and contours, sub-soils and earth-work, road metal, road location, bridges, and machinery. In addition to this, systems of road management are to be considered, and the efficient supervision of labor. Treating of one department—the road surface—it is impossible to ignore various other features. Mud underneath the road is more destructive than mud on the surface, so that without a well-drained and firm sub-soil, the best road surface must prove a failure. The science of road construction is broad, and to discuss briefly a few details, it is necessary to assume a suitable foundation, that the road is well located, that drainage is ample, and that the turnpiking is sufficient.

The Application of Road Metal.

Road metal is placed on a road to make, as far as possible, a waterproof covering for the soil; to make a surface that will resist wear; to distribute the concentrated wheel load over a greater area of sub-soil; and to overcome the surface tendency to mud and dust. The sub-soil should be crowned, and should be even, without depressions. This is particularly necessary in the case of clay. If there are depressions in a clay surface below the stone, water will find its way into them, will lie there, soften the soil, and weak spots will develop in the road surface through a condition of mud below it.

Before putting stone on an earth roadbed, the subsoil should be solidified with a roller. This is too commonly evaded in an effort to keep down the cost. It is necessary that the metal form a distinct crust, if its full degree of usefulness is to be obtained. Stone forced down into a soft sub-soil is largely wasted. However firmly a surface layer of road metal may itself be rolled, it will display weakness if the sub-soil has not been consolidated. Earth in its natural state, however solid it may appear, is not as compact as rolling can make it. The cost of roads is not so much in the earthwork, as in the cost of treating and hauling surface material. In the amount of metal saved from sinking into a loose sub-soil, and in the greater strength of the road, the cost of rolling the sub-soil is more than repaid.

The road metal, gravel or stone, is intended to form a separate crust over the natural soil, and should be so treated by rolling that it will be a distinct and firmly compacted covering. The benefits of rolling are numerous, and difficult to sum up briefly. Rolling is an absolute necessity for the most economical, as well as most durable and satisfactory type of road. Without rolling, a large proportion of the road metal is forced into the sub-soil and wasted before it is bonded into a distinct crust. The road cannot be well formed when it is left for traffic to consolidate. The citizens who are compelled to drive through a mound of loose road metal, will never give praise to the man who constructs such a road. By building a finished road on which it is a delight to drive, a little extra cost is quickly forgotten. A more durable road is obtained, and the additional expense is further offset by the considerable saving of road metal.

Construction of Surfaces.

A road surface may be constructed in various ways. The road may be surfaced wholly with crushed stone, using "crusher run"; that is, a mixture of fine and coarse just as it comes from the crusher, without screening. This makes a surface of uneven quality and strength, and hollows and holes appear quickly under heavy traffic. Screened stone may be used, placing the coarsest in the bottom and the finer on top. This makes a much smoother surface of more uniform strength than does "crusher run." It pays to screen, in the added durability of the road. Instead of making the road wholly of crushed stone, large flat stones, of sizes up to a foot or eighteen inches square, may be laid on the earth sub-grade, and crushed stone spread over this. This, as a rule, is cheaper than all crushed stone, as a thinner covering of fine (and more expensive) material is required. Where flake stone are used in this way, perfect under-drainage is desirable; otherwise the larger material is heaved by frost, and the finer metal gradually works downward, the large stones coming to the surface. Instead of laying the stone flat, they may be placed on edge, the largest at the centre of the road; the top angles being chipped off and wedged into the voids between the stone. This last method is known as a "Telford" foundation, and is to be recommended for weak sub-soils, or where drainage is difficult. Instead of a base of large stone, there may be spread a foundation layer of gravel, on which to spread the broken stone. This method is useful where gravel of an inferior quality is plentiful. The gravel makes a stronger foundation than does the natural earth, while the crushed stone makes a more durable wearing surface.

Good results may be had in some cases by using large flake stone for a base, and placing gravel on top. This process is useful principally where the earth foundation is very weak, and a gravel of first-class quality can be obtained within reasonable haul. A common method consists of using pit-gravel in the ordinary manner, without stone. Unless of very exceptional quality, gravel roads are not so lasting as broken stone, particularly for heavy or constant traffic—but it is a question of traffic as well as metal. As a rule, broken stone should be used near large towns. This provides for heavy traffic, with a short waggon-haul if the stone has to be brought in by rail. A profitable method of using gravel is to pass it through a crusher and screen out the excess of sand and earthy material. Use the screenings as a base, and place the stone on top for a wearing surface. By using a well-equipped plant, and loading waggons from a bin, the saving in cost of loading may be made to pay the cost of crushing and screening, particularly for short hauls from the pit.

In the choice of stone there is room for much variation in the quality of the road. After gravel, the most commonly used material in Ontario is limestone. In this there is much difference in quality, even in the same quarry. Limestone, while softer than most other rocks, gets its value largely by the power of its dust and screenings to cement and re-cement, making an exceptionally waterproof covering, and so bonding as to distribute the concentrated wheel load. The most durable class of road metal is trap rock, but unfortunately there is little available. Granite and gneiss are used with considerable success. Sandstone is very inferior, as it grinds readily into dust, and has little cementing value. Granite and gneiss have not good cementing value, but are harder and more resistant to wear. The strength and durability of a road is dependent largely upon the binding material used, as developed by thorough sprinkling, and the use of a steam roller. When rolling a road, a roller should be preceded by a sprinkler, and the stone kept well saturated. Limestone screenings are most valuable as a binding material, but some limestones have a much stronger cementing value than others. Crystalline limestones are in some cases of little more value in this respect than sandstones. Sand is a very inferior binder. Road metal should be clean, for clay and loam are weak binders. Crushed gravel with limestone screenings to bond it, makes a surface much superior to gravel only.

Width and Crown.

The width of roads is an important detail in surface treatment. Throughout Ontario all varieties of ideas prevail in this regard. We find the roads graded almost from fence to fence, the full width of the road allowance. In other cases the opposite degree is sought. From study of road conditions in Ontario, I am convinced that the width of a road from ditch to ditch should be no greater than the traffic demands. The width of road metal should be such that there will not be an earth track at the side. Wide roads are very desirable when kept in good repair, nor are they much more expensive to construct than narrow roads. But they are vastly more difficult and expensive to keep in repair. The choice, except under special conditions, will be between a narrow road that is good, and a wide road that is bad. Few municipalities in Ontario, or indeed in any part of the world, will be found so wealthy that they can afford to maintain an unnecessary width of road. When a strip of macadam is flanked by wide, flat shoulders, the early destruction of the macadam is certain. Standard European practice is 18 or 20 feet between gutters, and while many roads are wider, others are narrower. This is a point of economy which, for the sake of good roads at least, municipalities in Ontario could well copy.

The camber or crown of a road gives much play for difference of opinion. A high crown is not desirable so far as traffic is concerned. A new road, however, should first be turnpiked and crowned too high; otherwise it will soon get too flat. A road just right, when first constructed, will be water-logged at the end of a couple of years. All forces of gravity and traffic are at work to bear down on the camber and grade; the flattening tendency is constant. Under ordinary circumstances in Ontario a crown of one inch to the foot for the stone covering, and two inches to the foot for earth shoulders, is not too great. In the case of town streets, if constant attention is given to repair, and the roads are mecadamized from curb to curb, this can be reduced; but in the country, narrow roads, sharply crowned, are the roads which return most for the expenditure on them.

The coming of the automobile has drawn attention to the exceedingly dusty condition of roads in summer. The extended use of these machines requires that there be some palliative, both for the property owners along the roads, and for the maintenance of the roads themselves. While light motor vehicles travelling at a moderate speed will not seriously injure the roads, the dust removed by heavy touring cars travelling at a high speed, removes the binding material, and the stone "unravels." A large amount of experiment has been carried on with a view to finding a remedy. Many materials, patented and otherwise, have been brought to public notice. Their careers are usually ephemeral. Tar and tar products are materials which have been used with most marked success in England, France, and the United States. A thoroughly serviceable and cheap system has not been developed. The majority of methods are either too expensive for ordinary use in Ontario, or they are unsuited to our conditions of climate

This is one of the fields in which there is room for invention in road construction. At the International Road Convention in Paris during October of last year, all departments of road construction received careful and scientific attention. In the conclusions of this convention, however, it has not been shown that any marked advance has, in recent years, been made in methods of construction. The field is still an open one, and there is much to be hoped for, in achieving a type of construction that is at once serviceable, durable and economical.

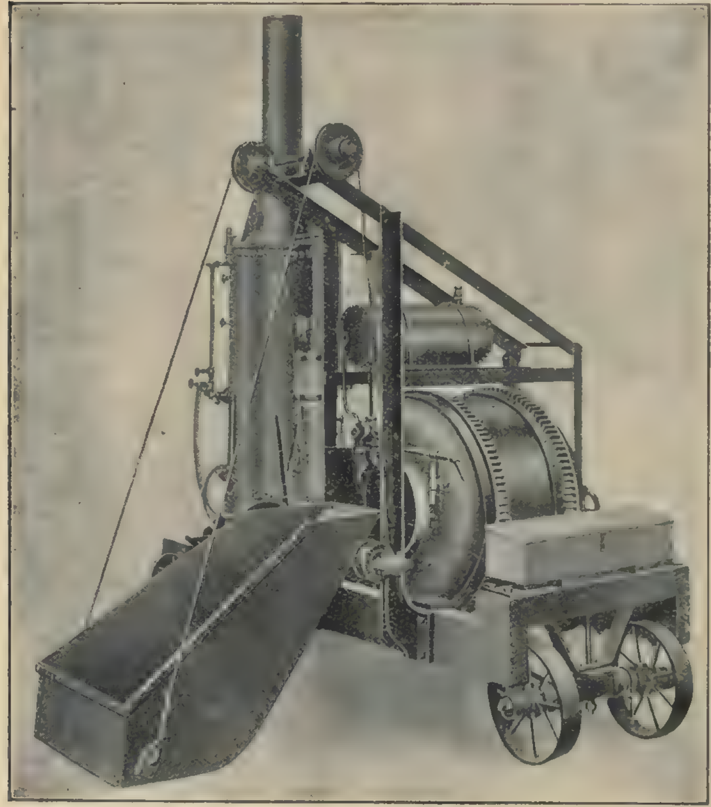
Among the resolutions adopted at the recent International Road Congress was one affirming that motor vans, drays, delivery waggons, and other vehicles used for commercial purposes cause no serious damage to highways so long as (1) the average speed is not more than 9 miles an hour and the maximum speed does not exceed 15 miles, and the weight on the heaviest axle does not exceed three tons, with tires of india rubber, or (2) when the average speed is 6 miles an hour and the maximum 9 miles, the weight on the heaviest axle when working not exceeding four tons, the driving axle to have metallic tires with smooth faces.

The same resolution declares that the weight on the driving axle should be restricted to three tons and the pressure on each centimeter of width of the tire should never exceed 150 kilos (330 pounds). It was the opinion of the congress that properly built roads are not injured by motor vehicles travelling at any pace not exceeding 15 miles an hour, and there was a general sentiment among the delegates that before the whole problem can be satisfactorily solved, legislation will be necessary to compel motor vehicles to be built with governing devices which will prevent them from being driven above certain well-defined rates of speed.

Additional Features of Recent Cement Show

Koehring Mixer—Canada Foundry Company

At the recent exhibition of the Cement & Concrete Association held at the St. Lawrence Arena, Toronto, there were many interesting displays. The largest line shown was that of concrete mixers, there being some twelve different types on exhibition. One of the latest to make a bid for Canadian patronage was the Koehring mixer, exhibited by the Canada Foundry Company, Limited, Toronto, who will exclusively manufacture and sell this mixer in Canada. The Koehring mixer has been on the American market for a number of years and the uniform success of the product has formed a strong argument for its adoption.


The Koehring Mixer.

The mixer here shown is their standard No. 1 B type, especially designed for small building, mounted on trucks so as to be easily moved from one contract to another. The 11-foot mixer complete, with loading device, steam engine and boiler weighs about 2½ tons. It is of the revolving drum batch type, having an automatic loader attachment of the simplest kind, this loader having a capacity to lift the entire batch dry. Mounted over the loader is an automatic measuring water tank which by one-quarter turn of a three-way valve rapidly discharges a specified amount of water into the drum. This tank is tested at 120 pounds, thereby admitting of the city pressure being attached continuously. The principal points of difference between this drum and others, is that the ends are made of heavy cast iron, and rounded so as to allow no chance for material clogging in the corners. These two drum-heads are connected by a heavy boiler plate upon which are placed the mixing-blades and scoops. These are all made with rounded corners and placed at such an angle as to cause the material to keep travelling during the whole revolution of the drum, thereby causing an even mixture.

On each drum-head is cast a heavy gear which is connected to two cast steel pinions mounted upon a shaft, in turn geared to the motive power, which may be either steam engine, gasoline engine, or electric motor. All pinions are made of cast steel and the design throughout is heavy and substantial, as required for such rough work. The upright steam engine supplied is of 6 horse-power capacity, the boiler being 8 horse-power, leaving ample room for the operation of injector.

Cement Testing—Bowman & Connor

One of the educational features of the show was the exhibit of cement testing by Bowman & Connor, engineers, of 36 Toronto street, Toronto. Their exhibit consisted in performing or illustrating the various physical tests of cement, together with a collection of photographs and drawings of various concrete structures recently designed by them.

The tests illustrated were tensile strength, time of set, soundness, fineness, and specific gravity. Many enquiries were made as to the objects of each of these tests. Portland cement is a scientifically prepared mixture of various ingredients which must be present in definite proportions. The physical tests are the readiest means of determining the quality of the cement and its behavior under these tests is an index of its suitability for use, both as regards its strength and ultimate durability. These tests also show what may be wrong in a cement, and so the physical tests as well as the chemical are also performed by the cement mills in perfecting their product. On account of the variability of raw material great care has to be taken in the manufacture of cement. There is often a good deal of variation even in the product of the same mill, and so for important work all cement should be tested.

Mushroom System—Clarke & Monds

Amongst the systems of reinforced concrete a great deal of interest centred around the model, drawings and photographs of the Turner Mushroom System as exhibited by Clarke & Monds, engineering contractors. A fine interior view of the new Barthelmes Building, on Carlaw avenue, Toronto, which has just been completed according to this system, and a model of the reinforcement used therein gave the visitors a good idea of the construction.

The feature of the system is the entire absence of beams in the interior of the building, the floor slabs resting directly on columns with slightly flared heads. The reinforcement, which consists of plain round rods radiates directly from the enlarged column-head through the floor slab to each of the eight surround columns, thus providing steel tension members in all directions in the slab, as against the single direction of other systems. Spans up to 30 feet square are now being constructed and for any required live load.

Some of the advantages claimed for the system are: Better distribution of light; increased clear head-room (slabs are only about eight inches thick); more pleasing architectural appearance; no limitation to placing of sprinkler systems or shafting; ease of original floor-form construction, and the use of plain steel bars, as against expensive fabricated or deformed materials.

Hobbs Manufacturing Company, of London, were there with a line of the American 3-way prisms, for which they are Canadian agents. The booklets circulated by the company give a full and very interesting description of the strong points of this line. It is understood that they are meeting with success in the Canadian market.

The Peerless Mould Company, Kendallville, Indiana, had on hand a display of concrete moulds for making cement bricks, concrete fence posts, sills, and circular blocks for wells, cisterns, water tanks and the like. Both the adjustable sill moulds, and the circular moulds can be used for a great variety of work. All the moulds made by this company are patented in the United States and Canada.

Publications and Catalogues

The Jas. Smart Manufacturing Company, Brockville, Ont., have recently issued very attractive booklets describing in detail the construction and operation of the Kelsey warm air generator for home, church and school heating. The manufacturers state that 35,000 of these heaters have been sold to home users since 1889 ,and that over 7,000 have been placed in churches, schools and public buildings. The claims advanced by the company for the efficiency, healthfulness, and economy of the Kelsey warm air generator are based on the following: (1) Its superior construction with zig-zag heat tubes or sections; (2) the great heating surfaces of these tubes and their weight; (3) the method of warming large volumes of fresh air by passing in separate currents through these heat tubes; (4) the even, positive circulation of the warm-air currents which may be controlled and forced to distant and exposed rooms; (5) most economical use of fuel, because all the heat is utilized with the minimum loss of same in the cellar or up the chimney; (6) ease of management, low repair expense, and actual results secured during the seventeen years it has been in use.

Mussens, Limited, Montreal, have published a special catalogue, No. 29, containing complete descriptions and illustrations of their municipal machinery and equipment. To municipal officers especially, and to all interested in the purchase of road building or maintaining machinery, this catalogue will make a direct appeal. It is doubtful whether any other firm in this country has ever attempted to get a complete range of road machinery and general supplies into one catalogue. The departure is a new one and a good one. As a book of reference this work will be found very valuable, particularly, as we have pointed out, to municipal officials, who should make immediate application for a copy. Special catalogues dealing separately with each of the various kinds of machinery and supplies may also be obtained.

In the February issue of "The Studio," published at 44 Leicester Square, London, Eng., will be found many features of special interest to all connected with the architectural profession. The pen drawings which appear in this number are revelations of artistic treatment and skilful reproduction, and the various reprints and engravings are none the less attractive. Builders, also, will find much that is profitable in this publication.

The Dodge Manufacturing Company, Toronto and Montreal, have issued a large and well illustrated catalogue of their sprocket wheels and chains. The catalogue will prove interesting to all users of power.

Concrete Work in Winter

It is always risky work for property owners or builders to lay concrete during cold weather, but in extreme cases this class of work can be done if proper precautions are taken In the cold and damp winter months concrete sets more slowly than during the warm periods, and for this reason it is argued that the centreing under it must be left in position for a proportionately long time. A writer in a recent issue of "Municipal Engineering" says that below a temperature of 50 degrees F. concrete sets slowly, and below 40 degrees is very inactive. At 32 degrees concrete freezes before setting. Remove any concrete known to have been frozen. A slight frost extending only one-fourth of an inch into concrete is not detrimental to strength. Some builders claim that concrete can be frozen, thawed out, and will then reset. This may be so in many cases, but it is always best to remove any concrete in which the freezing has extended throughout the mass.

Concrete work can be carried on when the temperature is as low as 20 degrees (never lower), if the precaution is taken to encase the building with canvas and place heating grates or salamanders under the floor being concreted. Keep the building at a uniform temperature of about 60 degrees. Do not allow intense heat to come in contact with the concrete, as it will dry out the concrete before it has set. Cover the concrete after being laid with some good insulating material, such as sawdust, straw, cement bags, manure, etc. Be sure to cover the concrete work before stopping work at night, even though it is warm during the day time. Salt dissolved in the water used in mixing concrete helps to prevent freezing by lowering the freezing point. A 5 per cent. solution (by weight) of common salt is ordinarily used and is not detrimental to strength when so used. Calcium chloride has an advantage over salt in that it reduces the freezing to a lower point. Dissolve in the water needed to properly mix the concrete 2 pounds of calcium chloride for each bag of cement used.

Heating the cement, sand, stone and water used in the concrete is helpful, but the materials must never be heated to a temperature of over 100 degrees, as the strength of the concrete will be weakened. Be sure that the concrete is thoroughly set (not frozen) before any centreing is taken down. Leaving all the upright supports in place, remove the sides of the columns and beam boxes and thoroughly examine the concrete. Then remove the slab centreing, and lastly the main supports. Leave the centreing in place a few days longer rather than take chances. Do not take down the centreing too soon.

Messrs. Britnell & Company, dealers in stone and builders' supplies, 1127½ Yonge street, take an optimistic view of the season's prospects. This year, owing to their many contracts on hand, including a large one for the new Transportation Building at the Exhibition Grounds, they were obliged to open their quarries on March 1st, rather more than five weeks earlier than their opening date last season.

The next annual meeting of the Canadian Manufacturers' Association will be held in Hamilton on Sept. 14th, 15th and 16th, 1909.

Recommendations for Railway Engineering

At the recent meeting of the Canadian Society of Civil Engineers in Toronto the report of the committee on transportation included the following principles recommended for practice in railroad construction:

(1) Similarity in form of specifications.

(2) Measurements of clearing and grubbing should be made in units of 100 feet square.

(3) A three-fold classification of materials. Solid rock, loose rock, and common excavation; and in special cases such additional classification of material as may seem necessary, such additional classes to be distinctly defined and specified in the contract.

(4) Profiles should be made complete to show quantities, classification, and disposition of material.

(5) There should be recognized three widths of roadbed for standard gauge railways, and these should be selected to suit the probable density of traffic to be handled. These widths should be 14, 16 and 20 feet.

(6) A width of 13 feet between centre lines of main tracks is recommended.

(7) Rock excavations should be taken out not less than 6 inches below subgrade.

(8) No wasting should be allowed closer than 10 feet from slope stakes.

(9) Local conditions and the character of material should invariably be taken into account in determining the permanent slopes of the roadbed cross-section.

The cement man should not reckon on getting half his sacks back carriage paid; neither should he forget to make an allowance for sacks not returned when getting out fresh cost prices.

Reliable Supply Firm

A well known firm of manufacturers of contractors' supplies is the Meaford Wheelbarrow Company, Limited, of Meaford, Ontario. They have a well equipped plant where they manufacture wheeled scrapers (both pressed and square bowl), pressed steel drag scrapers, contractors' dump carts for railroad and municipal work, contractors' dump cars and grading ploughs for railway work, wheelbarrows for railway contractors, cement workers, brick makers, etc.

A new line has recently been added by the purchase of the Canadian rights to manufacture the well known Sterling line of roller-bearing wheelbarrows and concrete carts made by the Sterling Wheelbarrow Company, of Wilwaukee, Wis. This is a line that has attained a wide popularity in the United States and Canada and for which there should be an ever-increasing market, as it embraces almost every conceivable style of wheelbarrow and cart for concrete work and general contracting use. All Sterling wheelbarrows and carts are mounted on patent roller-bearing wheels, which entail the minimum of effort in pushing about. Among the recent improvements to the Sterling line is the iron wheel guard, or nose piece, which forms a rigid front brace for the handles and is claimed to be the best possible protection to handles in forward dumping. Another improvement is the Sterling patent hand clamp, one for wooden handles and another for tubular iron handles. These have been introduced to strengthen the handles where the greatest strain comes and thus to eliminate the possibility of broken handles.

There is but one way of making great evils small: that of looking them straight in the face.—Democritus.

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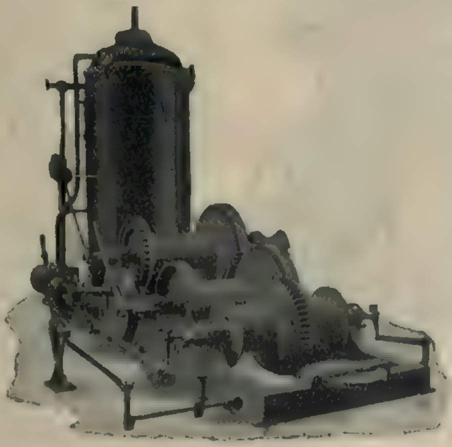

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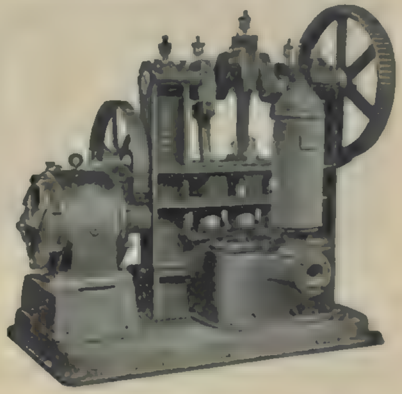

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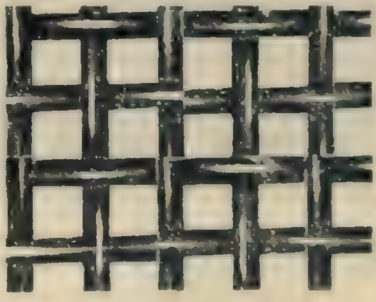

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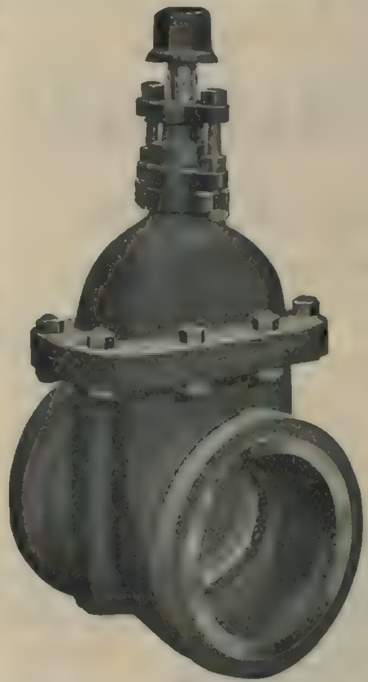

Towns and Cities

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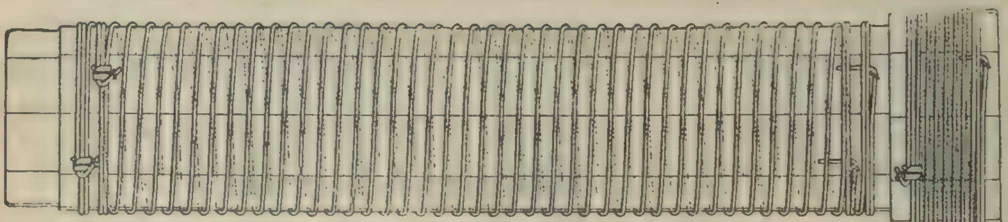

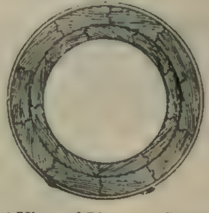

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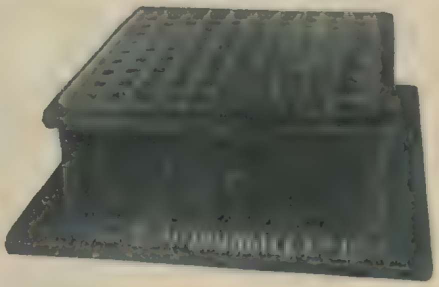

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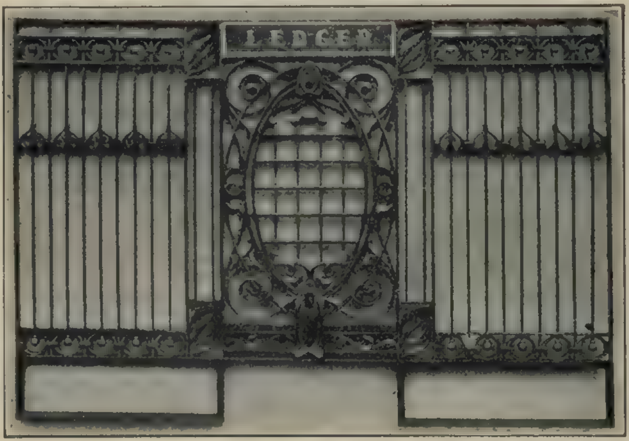

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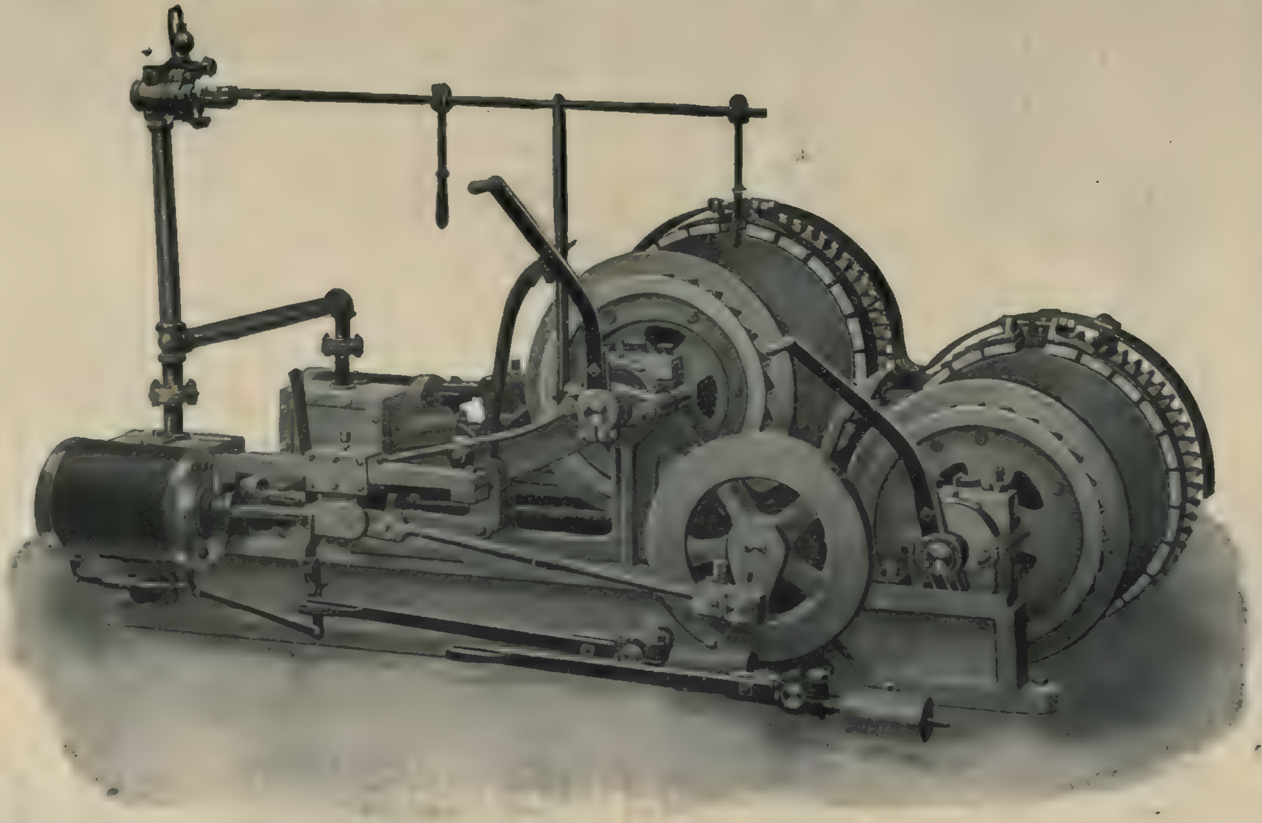

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Alberni, B.C.
The Alberni Water Works Company has been incorporated to supply the town with water for domestic purposes.

Brantford, Ont.
The following tenders submitted up to February 11th, were received for the Holmedale sewer extension: Orpen Company, Limited, Toronto, $18,670; Roy E. Secord & W. H. Lytle, Brantford, $24,633; Jas. Reid & Company, Brantford, $21,000; City Engineer, Brantford, $14,154. None of these tenders have been accepted, but it is probable that the city will do the work. T. Harry Jones, City Engineer.

Cobalt, Ont.
The Town Council is reported to have decided upon the installation of a waterworks system.

Exeter, Ont.
J. Senior, municipal clerk, states that the question of improving the waterworks is being discussed. Nothing definite has yet been done.

Fort Frances, Ont.
The Town Council has passed a bylaw to raise $20,500 for the extension of water mains.

Lethbridge, Alta.
The City Council is reported to have decided to expend about $64,000 in waterworks extensions, new sewers and sidewalks.

Quebec, Que.
Tenders will be received by J. Gallagher, Water Works Engineer, until April 12th for annual supplies for the Water Works Department. These comprise iron castings, lead pipe and pig lead, cement, brick and drain pipe.

St. Thomas, Ont.
The city have been authorized to proceed with the construction of the new sewage disposal works.

Toronto, Ont.
The department will advertise for tenders for the drainage system in Deer Park as soon as it passes the Court of Revision. The estimated cost is $85,000.

For the trunk sewer, the Board of Control have decided to recommend the use of concrete with a lining of vitrified brick.

City Engineer Rust states that no time will be lost in commencing the work on the trunk sewer and sewage disposal plant. The Godson Contracting Company will be awarded the contract for the work at the next meeting of the Board of Control.

Vernon, B.C.
A deputation which included K. W. Timmins, mayor, made application last week to the Provincial Executive for permission to use the Long Lake creek for the purpose of obtaining a water supply for this city.

Winnipeg, Man.
The city and the G. T. P. will construct a sewer in Nairn avenue, Elmwood.

AWARDED.

London, Ont.
Erratum.—In reference to the supply of sewer pipe, the contract for which was obtained by the Brick Manufacturing & Supply Company, the Hamilton pipe was not manufactured by this company, as stated in our last issue, but by the Hamilton & Toronto Sewer Pipe Company.

Railroads, Bridges and Wharves

Emerson, Man.
The Northern Pacific Railway will construct a bridge over the Red river in this district.

Ottawa, Ont.
It is expected that the construction of the Richmond road viaduct will be started this spring.

It is probable that the city will agree to the conditions suggested by the railway commission having reference to the raising of the Preston street bridge. The board orders it to be done if the city will pay one-half of the cost, or $8,000. If it will not assume that share the work will not be proceeded with. Some of the controllers have expressed themselves as favorable to the proposition and will support it. Should the legislation, which is applied for, be secured, the city would be in a position to issue a debenture for the work without waiting for a special act or having a vote of the property owners.

Prince Rupert, B. C.
The Provincial Government is considering the erection of a large wharf at this place.

Regina, Sask.
A dispatch from Grand Forks, N. D., states that D. W. Hines, of Hannah, contemplates the construction of a line from Duluth to Hudson's Bay, by way of Regina. It is stated that the Canadian Government will grant assistance. Application will shortly be made for a charter.

St. John, N.B.
Tenders for the construction of a wharf and warehouse will be received until April 5th by the Frances Kerr Company, Limited, of this city.

AWARDED.

Winnipeg, Man.
Contracts were let last week for the construction of 124 miles of new C. P. R. lines in the west. Three of the four new lines are in Alberta and the fourth is headed that way. Dutton & Tinson have the contract for 20 miles of the line west from Weyburn and an additional five miles may be added to their work. Foley, Welsh & Stewart have the contracts for the other three lines. Starting at Cheadle, just east of Calgary, they will build 40 miles north. A second branch, 28.5 miles in length, leaves Kipp on the Blood reserve south of Lethbridge and runs north to the Little Bow river. The third section is a branch 35½ miles in length east from Lacombe.

The commissioners of the National Transcontinental have had under consideration for some time the tenders for the N. T. R. terminals at Winnipeg, estimated to cost $1,000,000. It is understood that the chief engineer has reported in favor of the lowest tender, that of Haney, Robertsan & Quinlan of Montreal and Toronto, and it will probably be accepted.

Public Buildings, Churches, Schools, etc.

Atherley, Ont.
Tenders for the erection of a brick school house close March 31st with R. Leith, Secretary-Treasurer.

Fort Rouge, Man.
The Winnipeg School Board are taking tenders for the installation of a heating and ventilating system in the La Verandrye school.

Fernie, B.C.
Tenders close March 31st with D. V. Mott for the erection of a Methodist church and parsonage in this city.

Hamilton, Ont.
At a recent meeting of the Finance Committee, the sub-committee reported in favor of enlarging the Isolation Hospital on the present site at a cost of $8,000 or $10,000. This report will be recommended to Council.

Hull, Que.
The Fathers of the Holy Ghost, who conduct an agricultural college on the old Alonzo Wright property, near Hull, purpose enlarging their institution.

Montreal, Que.
Chief Tremblay, of the Fire Department, will recommend the remodelling of several of the fire stations.

Moose Jaw, Sask.
Tenders will be received by Frank H. Maybery, secretary, Young Men's Christian Association, Moose Jaw, until April 5th for all work, except heating, in connection with the erection of a building for the Y. M. C. A. W. A. Elliott, Brandon, architect.

North Bay, Ont.
Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until April 13th for additions to fittings at the post office. Plans may be obtained of L. A. Gauthier, post office, North Bay, and at the Department at Ottawa.

Ottawa, Ont.
It is stated that the chief engineer of the Grand Trunk has been instructed to call for tenders for the construction of a central depot.

Plans for the proposed new church for the Methodist Social Union have been ap proved. The new building will be of frame construction and will cost $3,000. Rev. G. Clendinnen is interested.

Owen Sound, Ont.

Tenders addressed to D. J. Kennedy, Chairman, Market and Public Buildings Committee, will be received until April 2nd for improvements to the town hall.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until April 13th for fittings for the customs office, post office and inland revenue office at this place. Plans at offices of Forster & Clark, architects, Owen Sound, Ont., and at the Department.

Tenders close April 2nd for electric light fixtures for the Owen Sound public building. Plans at the office of Forster & Clark, architects, this town, and at the Department of Public Works, Ottawa.

Quebec, Que.

A union depot is proposed for this city.

Stony Mountain, Man.

Tenders close April 8th for the erection of a brick school building.

Stratford, Ont.

The Collegiate Institute Board will ask the Council for funds for the erection of an addition to their building.

St. Thomas, Ont.

The Grace Methodist congregation will erect a new church at a cost of $25,000.

Saskatoon, Sask.

The erection of a new land office is under the consideration of the authorities.

Toronto, Ont.

The plans and specifications of the Transportation Building, to be erected at the Exhibition grounds, were submitted to the City Architect last week by Mr. George Gouinlock. The estimated cost of the building is $89,000.

$50,000, one-third of the estimated cost, has already been subcribed for the erection of the new St. Paul's Anglican Church.

A new athletic organization, which will have its headquarters at the T. A. A. A. grounds, is now being formed. Among other projects, it is planned to build a hockey rink.

Plans for the new general hospital are stated to be well advanced. Mr. Wm. Rundle, of the Building Committee, says that work on the institution may be commenced this summer.

Darling & Pearson, architects, 2 Leader Lane, Toronto, will receive tenders until April 5th for all trades required in the erection of the St. James' Parish House, Church and Adelaide streets.

Construction will be started at once on the new library for Victoria College to be erected at the corner of North Drive and Charles street. Estimated cost $75,000.

The Orange Order have approved plans and estimates for the extension of Victoria Hall, Queen street east, at a cost of $40,000. The whole building will be renovated, steam heated, ventilated and fitted with elevators. Architect, E. J. Lennox.

The plans for one wing of the new Western Hospital have been practically approved, and estimates will be invited almost immediately. The new portion will cost $175,000. The whole building, when completed, will cost $600,000, and will be built in the form of an H. Only one side of the H is to be built at present, and it is to be three storeys high and 350 feet long. The structure is to be fireproof, and will be built of red brick, with cut-stone trimmings. E. J. Lennox, architect.

The Board of Control have set apart a portion of the jail property on the north-west corner of Gerrard street and Broadview avenue as a site for the Carnegie branch public library.

Vancouver, B.C.

Architects are invited to submit drawings in competition for a combined passenger station and office building to be erected in Vancouver by the British Columbia Electric Railway Company, Limited. The latest date on which competitive plans will be received is April 26, 1909. Application for the programme outlining the terms of the competition should be made immediately, by letter, to R. H. Sperling, general manager.

The Vancouver Lawn Tennis Club have a permit for a club house to cost $3,800.

Tenders are about to be taken for the new high school to be erected at the corner of Parker street and Cotton Drive. Estimated cost, $40,000. A. C. Hope, this city, architect.

West Toronto, Ont.

The High School Board have asked the City Council for $50,000 for improvements to the Collegiate Institute.

Winnipeg, Man.

The School Board has decided to erect a twelve-roomed two storey school with an assembly hall in the attic. The estimated cost of the building is $40,000.

The Salvation Army officials are having plans prepared for a barracks they intend erecting here during the summer.

It is expected that tenders will shortly be taken for the proposed sanitarium at Ninette. Smith & Bruce, architects.

Yorkton, Sask.

Plans for the new St. Andrew's Presbyterian church have been approved. Estimated cost, $15,000. Architect, J. H. Russell, Winnipeg.

AWARDED.

Fort Rouge, Man.

Saul & Irish have been awarded the contract at $69,920 for the erection of the La Verandrye school.

Meaford, Ont.

The contract for the new Anglican Sunday school has been awarded to James Sparling. Estimated cost, $5,000.

Newcastle, N. B.

The contract for the stone annex to the Harkins' Academy has been awarded to Henry Ingram, of Newcastle, N. B., and John McDonald, of Chatham, N. B., at about $37,000.

St. Boniface, Man.

Senecal & Smith have secured the contract for an addition to St. Mary's Academy at $80,000. Plans prepared by Senecal & Hudson, St. Boniface, Man.

St. Thomas, Ont.

Tenders for the remodelling of the club house for the St. Thomas Golf Club have been awarded as follows: Masonry, A. E. Ponsford; carpentry, P. Campbell; plumbing, C. Bull; painting, E. Dallyn. Architect, N. R. Darrach, this city.

Contracts for the new school at Yarmouth Heights have been awarded by N. R. Darrach, architect, as follows: Masonry, Little & Lind; carpentry, J. M. Green & Sons.

Toronto, Ont.

Contracts have been awarded for the erection of the new wing to the Home for Incurables, on Dunn avenue, and the new Nurses' Home. The wing will cost $33,000, and the Home $22,000. Denison and Stevenson are the architects. The successful tenderers are as follows: New wing, Home for Incurables—Masonry: John Aldridge & Son; carpenter work, A. B. Coleman; tiling, J. L. Vokes; steel, McGregor & McIntyre; painting, F. E. Phillips; deck roofing, Carey Roofing Company; slate and copper, A. B. Ormsby; plumbing, Purdy, Mansell; plastering, R. C. Dancey. Nurses' Home—Masonry, R. Hewitt & Son; carpenter work, John McKerracher; tiling, J. L. Vokes & Sons; steel, Toronto Iron Works; painting, H. W. Johnston; plastering, B. C. Dancey; slate and copper, J. Matthews; plumbing, Purdy, Mansell. The total cost, including heating system, etc., will be between $60,000 and $70,000.

The Board of Education have awarded the following tenders in connection with the enlargement of Riverdale High School: Mason work, H. Lucas & Sons, $21,500; carpenter work, W. Williamson, $11,572; plastering, T. Blackburn & Son, $2,180; painting, Hughes & Company, $1,800; plumbing, Keith & Fitzsimmons, $885; roofing, A. B. Ormsby & Company, $1,767; heating and ventilating, Fred Armstrong Company, $4,600; steel fireproofing, Expanded Metal Company, $911; heat regulation, Johnston Temperature Regulation Company, $567; electric wiring, Bennett & Wright, $86; structural steel, Reid & Brown, $783; total, $46,651.

Contracts in connection with the enlargement of Kent School have been awarded as follows—Masonry, H. Lucas & Son, $46,200; carpentering, Frank Armstrong, $24,487; plastering, T. Blackburn & Son, $3,150; painting, R. J. Wray, $2,590; plumbing, Bennett & Wright, $1,520; roofing and tinsmithing, Flowers & St. Leger, $2,198; structural steel, Reid & Brown, $4,172; heating and ventilating, Fred. Armstrong, $4,105; reinforced steel, Expanded Metal Company, $1,818; heat regulations, Johnston Temperature Regulation Company, $1,049; electric wiring, Bennett & Wright, $25; total, $97,709.

The tenders of the Expanded Metal Company for reinforced steel for the Fern avenue School and the Girls' Home, at $236 and $562, respectively, have been accepted by the Board of Education.

Wainwright, Alta.

The Dominion Government have awarded the contract for the new immigration hall here.

Residences

Montreal, Que.

J. Perrault, architect, 17 Place d'Armes Hill, has prepared plans for eight two storey dwellings to be erected on Park avenue, near Bernard, for Mr. J. M. Derion. Estimated cost, $18,000.

Finley & Spence, architects, Guardian Building, have completed plans for an apartment house, to be known as the "Seaforth," to be erected on Cote des Neiges road. G. W. Badgley, 124 St. Peter street, Montreal, is promoting the company which will erect the building.

Ottawa, Ont.

Hon. Wm. Pugsley is interested in the erection of a large apartment house on Vittoria street.

Toronto, Ont.

Tenders are being taken by H. Franks, 100 Shaw street, for the erection of two pairs of solid brick houses; all trades except carpentry.

Recent building permits include: John F. Connolly, 2½ storey brick dwelling, Avenue road, $8,000; John Keen, pair semi-detached 2 storey and attic brick dwellings, Concord avenue, $5,000; F. J. Cummings, 2 detached 2 storey brick dwellings, Radford street, $5,000; Mrs. Emma Cotton, pair semi-detached 2 storey brick dwellings, Ossington avenue, $3,600; D. Campbell, 2½ storey brick dwelling, Rose avenue $4,000; J. Clemens, 2 storey and attic brick dwelling, Westminster, $3,500; Mrs. E. D. Y. Cohen, 3 storey brick apartments, George street, $17,000; J. G. Kent, 3 pair semi-detached 2 storey and attic brick dwellings, Hepbourne street, $15,000; T. A. Hussey, 2 storey and attic brick dwelling, Dufferin street, $3,200; W. J. Forde, pair semi-detached 2 storey brick dwellings, Wright avenue, $4,000; G. W. Dale, 2 storey roughcast dwelling, brick front, Pape avenue, $3,200; Robert Ewing, 2½ storey brick dwelling, Boustead avenue, $3,200; Ansman & Marshall, 2 detached 2½ storey brick dwellings, Palmerston avenue, $6,000; T. Painter, 2 storey and attic brick dwelling, College, $4,500; James Kyle,, 2 detached 2½ storey brick dwellings, Pearson avenue, $6,000; Wm. Hodgkinson, pair semi-detached 2½ storey roughcast dwellings, brick fronts, West avenue, $4,000; Henry Carter, pair semi-detached 2 storey brick dwellings, Follis avenue, $,4000; A. Robertson, pair semi-detached 2½ storey brick dwellings, Westmoreland avenue, $5,000; C. H. Fleming, 2½ storey brick dwelling, Castle Frank crescent, $7,000; Geo. Birdsall, 3 detached 2½ storey brick dwellings, Garden avenue, $7,500; Tait, Angus and Company, pair semi-detached 2½ storey brick dwellings, and a 2 storey store and dwelling, corner Ossington and Hallam, $6,500; W. N. McEachern, pair semi-detached 2½ storey brick dwellings, corner Lee and Violet, $4,000; P. W. Benner, pair semi-detached 2½ storey brick dwellings, corner Grace and Bloor streets, $7,000; McMurchy & Fyfe, 2½ storey brick dwelling, Constance street, $3,300; S. H. Hurst, 2½ storey brick dwelling, Geoffrey street, $3,500; S. H. Hurst, 2 detached 2½ storey brick dwellings, Walter street, $7,000; H. H. Davison, 2 storey and attic brick dwelling, Palmerston Square, $4,500; Phippen Bros., pair semi-detached 2 storey brick veneer dwellings, corner Pape and Withrow avenue, $5,000; W. J. Whaley, 3 attached 2 storey brick dwellings, Christie street, $5,500; J. A. Moffit, 3 attached 2 storey brick dwellings, Millicent crescent, $5,000; Frank Ryan, 2 storey and attic brick dwelling, Gladstone avenue, $3,500; W. E. Goulding, 2½ storey brick dwelling, Constance street, $3,500; Dr. W. T. Stewart, 2 storey brick dwelling, corner Indian road and High Park avenue, $4,500; J. O. Oliver, 2 storey and attic brick dwelling, Lynwood avenue, $3,500; F. L. Beecroft, 1½ storey brick dwelling, Dowling avenue, $4,500; Elmer Duff, pair semi-detached 2½ storey brick dwellings, Roncesvalles avenue, $7,500; Scott & Mackey, 3 pair semi-detached 2 storey brick dwellings, corner Gladstone avenue and Hallam, $11,000; Scott & Mackey, 2 storey brick store and dwelling, Gladstone and Hallam, $3,000; A. J. Peppiatt, 2½ storey brick dwelling, Wright avenue, $3,500; Elmer Duff, 2½ storey brick dwelling, Roncesvalles avenue, $4,000; S. J. Glen, pair semi-detached 2 storey brick dwellings, Lindsay avenue, $4,500; F. Courtmarche, pair semi-detached 2½ storey brick dwellings, Marmaduke street, $6,000; Wilkins & Company, pair semi-detached 2 storey brick dwellings, Huron street, $6,000; Wilkins & Company, 3 pair semi-detached 2½storey brick dwellings, Dupont street, $15,000; T. E. Washington, 3 attached 2½ storey brick dwellings, Manning avenue, $6,500; John Houden, 2½ storey brick dwelling, Howard Park avenue, $3,000; Walter Benson, pair semi-detached 2½ storey brick dwellings, Nanton avenue, $6,000; Waters & Elliott, 2 pair semi-detached 2½ storey brick dwellings, Vermont avenue, $9,000; Henry Barron, 2 rows, 3 attached 2 storey brick dwellings, Carrol street, $11,000; David Modley, 3 2-storey and attic brick dwellings, corner Ossington and Churchill avenues, $7,000; Will J. White, 2 pair semi-detached 2 storey brick dwellings, corner Galley and Sunnyside avenue, $7,500; W. J. Hewitt, 2 detached 1½ storey brick dwellings, Oak avenue, $8,000; J. A. Orr, pair semi-detached and one detached 2 storey brick dwellings, Margueretta street, $6,000; H. Nixon, pair semi-detached 2 storey brick stores and dwellings, and 4 attached 2 storey and attic brick dwellings, $16,000; L. A. Beatty, 2½ storey brick dwelling, Parkway avenue, $3,500; The R. W. Fletcher Company, 2 storey brick dwelling, West Marion street, $3,200; Willmott and Alphaugh, 2½ storey brick dwelling, Woodlawn avenue, $4,800; Thomas Boland, pair semi-detached 2 storey brick dwellings, Brock avenue, $4,000; J. S. Case, 2½ storey brick dwelling, Roncesvalles avenue, $4,000.

Vancouver, B.C.

E. Stanley Mitton, architect, has prepared plans and is calling for tenders for the erection of a two storey frame dwelling on a concrete foundation, to be built on First avenue, for Mr. W. J. Brouberg.

Mr. W. F. Gardiner is about to take tenders for a large residence for Mr. W. D. Morrison, of this city.

Winnipeg, Man.

D. E. Clarke will erect three dwellings at a cost of $2,000 each, on the west side of Home street.

A permit has been granted to Thos. Nelson to erect a two and a half storey dwelling on McMillan between John and Hugo streets, at a cost of $3,500.

Westmount, Que.

Saxe & Archibald, architects, 59 Beaver Hall Hill, Montreal, have completed plans for the erection of a resdence in Westmount for Mr. Scott.

AWARDED.

Vancouver, B.C.

Grant & Henderson, architects, this city, have awarded the contract for the erection of a two storey frame dwelling to R. A. McCollough, contractor. The cost will be about $6,000.

Business Buildings and Industrial Plants

Barrie, Ont.

The ratepayers will vote on April 12th on a bylaw to raise $40,000 as a loan to the Webber Engine Company, who would erect a factory and employ 50 hands at the outset.

Birch Hills, Sask.

Considerable extensions are being made at the Birch Hills creamery.

Brandon, Man.

Tenders are being taken for the new factory to be erected in this city by George White & Company, of London, Ont.

The Trades Council may erect a building at a cost of $15,000.

Brantford, Ont.

Palmer & Company, manufacturers of steam pressing machinery, Syracuse, N. Y., contemplate the erection of a factory here.

Chilliwack, B.C.

The Board of Trade have forwarded to the Provincial Government a resolution urging the erection of a land registry office.

Cornwall, Ont.

The Windsor hotel, managed by A. Laplante, was destroyed by fire last week.

The plant of the Cornwall Paper Manufacturing Company, Limited, has been sold to the St. Lawrence Paper Mills Company, Limited, who will make important extensions.

Chatham, Ont.

Tenders addressed to Joseph Yott will be received until March 31st for all trades in the erection of additions, etc., to the Park Place hotel. Plans and specifications may be seen at office of architects, Wilson Son & Arnold.

Hamilton, Ont.

The buildings of S. Chappell and others at Crown Point were destroyed by fire at a loss of $3,000.

Hull, Que.

A Gatineau Point firm has purchased four lots of land with a view to establishing a sash and door factory.

Montcon, N.B.

The Maritime Coal, Railway & Power Company, of Maccan, contemplate building a wharf and coal sheds this season.

Montreal, Que.

Layton Bros. will this summer make extensive alterations to the properties now occupied by the McNee Piano Company.

New Westminster, B.C.

Work upon the construction of large nail and wire works will shortly be commenced by the Hamilton Wire & Nail Company.

Portage la Prairie, Man.

The Ogilvie grain elevator, at Willow Range, was recently destroyed by fire.

Prince Albert, Sask.

Agnew Bros.' Hardware Company, have decided to build a two storey block on Selkirk street opposite the Hudson block.

The Prince Albert masons are getting out plans for a three storey block on Selkirk street. Estimated cost, $50,000.

The Imperial Bank has plans for a bank building at the corner of Selkirk street and Central avenue.

Paris, Ont.

The ratepayers have approved a bylaw to guarantee the bonds of the Sanderson Screen Works Company, who will at once rebuild their plant which was recently destroyed by fire.

Port Arthur, Ont.

J. D. Matheson, of Warren & Wetmore, architects, New York, was recently here in connection with plans for the new C. N. R. hotel.

Darling & Pearson, architects, Winnipeg, have plans for a business building for R. A. Ruttan, real estate agent. Estimated cost, $50,000.

Ridgetown, Ont.

Tenders are invited until April 1st by George McDonald, Clerk, Ridgetown, for the proposed addition and remodelling of the Howard township hall. Wilson, Son & Arnold, architects, Chatham, Ont.

Rosthern, Sask.

A creamery will be established here by Hunt & Son, of Winnipeg.

(Continued on page 23)

Tenders and For Sale Department

Notice to Contractors

Tenders will be received by the Alvinston School Board until FRIDAY, APRIL 2nd, for a Hot Air System of Heating, including proper ventilation for the use of the Alvinston Public School. The lowest or any tender will not be accepted unless otherwise satisfactory.

13 ALEX. M. PHAIL, Secretary.

TENDERS

Tenders will be received by the undersigned until noon on FRIDAY, THE 2nd APRIL, for the construction of a Bridge over Catfish Creek at Jamestown, Township of Yarmouth; also for the construction of Concrete Abutments for a Bridge to be built over the Otter Creek at Richmond Township of Bayham. Both these bridges to have concrete floors. Also for the furnishing and driving of about 250 piles in Kettle Creek at Port Stanley. Plans and specifications can be seen at this office, where blank forms of tender can be obtained.

JAS. A. BELL,
County Engineer,
13 St. Thomas, Ont.

Town of New Liskeard

Waterworks

Tenders will be received by the undersigned until the 15th DAY OF APRIL, 1909, for the supplying of Cast Iron Water Pipe and other Castings, Valves, Hydrants, and for excavating and refilling Trenches and Laying Pipes, Setting up Hydrants, etc., for the extension of the New Liskeard Waterworks System, there being about seven thousand nine hundred feet of six inch and four inch pipe to lay. Plans specifications of the work, etc. form of agreement and bond may be seen and form of tender may be obtained at the office of C. H. Fullerton, Town Engineer, New Liskeard.

H. HARTMAN,
Clerk.

New Liskeard, March 10, 1909. 15

Temiskaming and Northern Ontario Railway Commission

Sealed tenders addressed to the undersigned and marked on the envelope "Tender" will be received up to 12 o'clock noon on WEDNESDAY THE 14th APRIL for the following works:—

1. **Culvert near Mileage 21½.**
2. **5 ft. Arch Culvert near Mileage 50¾.**
3. **20 ft. 1 Beam Span near Mileage 62½.**

Plans and specifications may be seen at the office of the Secretary-Treasurer, 25 Toronto St., Toronto, or at the office of the Chief Engineer, North Bay.

Forms of tender and amount of deposit necessary in respect of each item can be obtained on application to the Secretary-Treasurer at above address.

Lowest, or any tender, not necessarily accepted.

A. J. McGEE,
Secretary-Treasurer.

25 Toronto St., Toronto,
March 18th, 1909.

Papers inserting this advertisement without authority will not be paid for same. 14

TENDERS

Tenders will be received by the undersigned up till noon MONDAY, APRIL 5th, 1909, for all the trades required in the erection of St. James' Parish House, Church and Adelaide streets. Plans and specifications may be seen and all information obtained at the office of the architects,

DARLING & PEARSON,
13 2 Leader Lane, Toronto.

City of Medicine Hat

Tenders for Gas Well

Tenders for the drilling of a well for the city will be received at the office of the undersigned up to APRIL 30th, 1909.

Tenders to be given as follows: The contractors to furnish all labor, pipe, machinery and material; anchor and sheet in well in a practical manner.

The city to pay for all pipe, which is necessary to leave in the well or the contractor may tender to furnish labor only, anchor and sheet in well in a practical manner.

Specifications may be obtained by applying to undersigned.

W. P. MORRISON,
14 City Commissioner and Engineer

CITY OF SASKATOON
Province of Saskatchewan

Tenders for
Excavating and Pipelaying

Sealed tenders will be received by the City Clerk until 8 p. m. on TUESDAY, APRIL 13th, 1909, for all labor necessary for laying Water Mains and Sewer Pipes, and furnishing certain materials therefor according to plans and profiles dated April 1st, 1909.

Plans and specifications may be seen at the office of the Chief Engineer, 103 Bay street, Toronto, or at the office of the City Clerk, Saskatoon, on and after April 1st, 1909.

WM. HOPKINS, Esq., J. H. TRUSDALE, Esq.,
Mayor, Saskatoon. City Clerk, Saskatoon.
WILLIS CHIPMAN, C. E.,
103 Bay street, Toronto, Ont. 15

Tenders Wanted

Sealed Tenders, addressed to the Williamson Construction Co., and marked "Tender for Concrete Footings," will be received at this office until 12 noon, APRIL THE THIRTEENTH, for the supply of forms, material and labor involved in the construction and placing of

Concrete Footings

required for the Steel Towers of the City of Winnipeg Transmission System from Point du Bois to Winnipeg.

Specifications can be seen, and form of tender and other information can be obtained at this office. Tenders will be received at a price per cubic yard of concrete. The successful tenderer will be required to commence work about May the first.

Each tender must be accompanied by a marked cheque for Five Hundred Dollars ($500.00), payable to the order of the undersigned which will be forfeited if the person tendering declines to enter into a contract when called upon to do so. The successful tenderer will be required to furnish a bond in satisfactory sureties in the sum of Three Thousand Dollars, ($3,000.00) for the satisfactory performance of the work.

The lowest or any tender not necessarily accepted.

LAMPORT & FERGUSON, Solicitors,
Canada Life Building,
Toronto, Ont.

The unauthorized insertion of this advertisement will not be paid for. 14

Underground Cable

Tenders for Underground Cable will be received up till APRIL 30th by the City of Toronto, Canada. For specifications and form of tender apply Electrical Department, City Hall.

Notice to European firms—For specifications and form of tender apply Preece & Cardew, 8 Queen Anne's Gate, Westminster, London, S.W., England. 14

City of Saskatoon, Sask.

Tenders for

Road Making Machinery

Sealed tenders will be received by the City Clerk, until 5 o'clock p.m. on TUESDAY, APRIL 20th, 1909, for the following:

1. One Stone Crusher of 10 to 20 tons per hour capacity.
2. One Elevator complete.
3. One Set Screens.
4. One Set of Bins.
5. One Ten Ton Road Roller.

For further information apply to the City Clerk.

J. H. TRUSDALE,
City Clerk.

Saskatoon, March 22nd, 1909. 15

Positions Wanted or Vacant

BRICKMAKER WANTS SITUATION or will take contract. Apply Box 430, CONTRACT RECORD, Toronto. 13

WELL DRILLER—Experienced man, wants job, can run drilling rig, good tool dresser. Address Box 65, Milverton. 13

A GOOD GRANITE AND MARBLE LETTERER AND CUTTER; must be sober; Protestant preferred; steady job. Box J, Maxville, Ont.

SHIP CARPENTER FOREMAN — To look after number boats out the city; highest wages to good man. Apply EDWARD RAMAGE, Shipbuilder, 267 Wellington Street, Toronto. 13

A CONSTRUCTIONAL SUPERINTENDENT—manager building, all trades, open for engagement; would take complete charge of branch office. Box 453, CONTRACT RECORD, Toronto. 13

ARCHITECTURAL DRAUGHTSMAN is open for engagement; twelve months' agreement required, at very moderate salary; has had good experience. Box 544, CONTRACT RECORD, Toronto. 13

WANTED — By advanced I. C. S. Student of 22 years, position in architects office. Three years experience as assistant architect. Practical outside experience and possess Commercial Diploma. Apply Box 709 CONTRACT RECORD, Toronto 13

WANTED—First-class Experienced Carpenter Foreman; must be a hustler; competent to lay out work and handle men to advantage, and used to work on brick and stone buildings; steady work to first-class man. Apply, stating experience, to NAVIN BROS., contractors, Moose Jaw, Sask. 13

ELECTRICIAN WANTED—to take charge of a small steam plant, do collecting and all necessary work in connection herewith; applicants must be qualified, industrious and temperate, must also give an approved bond to the amount of $500.00 as a guarantee to account for all moneys collected by him; applications to be in the hands of the undersigned not later than 12 o'clock noon, April 6th, 1909. Address W. J. CRYDERMAN, Clerk of the Village of Thamesville 13

Bridge Tenders

Tenders will be received by Jas. Laidlaw Esq., Clerk Township of Guelph, up to APRIL 10TH NEXT, for Steel Superstructure for

Bridge at Armstrong's Mills

For plans, specifications, &c., apply to the Engineers
BOWMAN & CONNOR,
36 Toronto Street.
Toronto, March 29, 1909. 13

Tenders for

New School Building

Bulk and separate "Sealed" tenders, addressed to the undersigned and marked "Tender" will be received up till noon THURSDAY, APRIL 15TH, 1909, for the several trades required in the erection of a New One Roomed School Building for School Section No. 18 Brant County, Ontario.

The lowest or any tender not necessarily accepted.

Plans and specifications may be seen at our offices, Hope Chambers, Brantford, Ontario.

TAYLOR & TAYLOR,
13 Architects, Brantford.

Business Buildings and Industrial Plants

(Continued from page 21)

Renfrew, Ont.

Construction will shortly start upon the erection of a new bank building which will probably be occupied by the Quebec bank.

Sherbrooke, Que.

White & Foulds, architects, this town, have plans for the erection of a large hotel, opposite the new C. P. R. station. The building will be of brick construction, four storeys high. Messrs. F. J. & W. H. Southwood, owners.

St. Marys, Ont.

In last week's issue of the Contract Record, it was mentioned that capitalists had secured options on some clay and rock land in this neighborhood and intended erecting a plant for the manufacture of cement. It is understood that the gentlemen behind the movement are Mr. John Lynd, of Owen Sound, and Dr. McNeilly, or Toronto, who are large shareholders in the Grey and Bruce Portland Cement Company of Owen Sound.

Saskatoon, Sask.

The International Harvester Company will at once commence the construction of a brick warehouse, estimated to cost $75,000.

Strathcona, Alta.

The premises of the Twin City Manufacturing Company will be enlarged this season.

St. John, N.B.

Geo. W. Marsh, W. L. E. Marsh, and Joseph Doust, Toronto; Robert N. Agnew and Charles Henry Clark, New York, are seeking incorporation in New Brunswick as the Port, Canada, Docks, Storage and Warehouse Company, with a capital of $99,000, and head office at St. George, N.B. This company seeks extensive powers to build docks, warehouses, elevators, and all terminal facilities. The C. P. R. is reported to be interested.

Thamesville, Ont.

Architect Davis, of Montreal, has plans for a new bank at this place.

Toronto, Ont.

It is stated that the Sunbeam Incandescent Lamp Company and another important industry are negotiating for the city's land on the east side of Dufferin street, south of King street. The former wish to duplicate their plant, and the latter to erect a building at an estimated cost of $100,000.

The Toronto Furniture Company plan considerable extensions.

M. A. Hunter has a permit for a two-storey brick store and dwelling corner of Wallace and Ada avenues at a cost of $3,000.

D. C. Murray has a permit for the erection of a two storey brick store corner of Yonge street and St. Clair avenue at a cost of $8,000.

H. Carter has a permit for the erection of a pair of semi-detached two storey brick stores and dwellings corner of Pendrith and Christie streets, at a cost of $3,000.

J. Daniels will build a pair of semi-detached brick stores and dwellings on Dundas street at a cost of $6,500.

A. E. Playter has obtained a permit for the erection of four attached two storey brick stores and hall, corner of Danforth and Broadview avenue, at an estimated cost of $20,000.

A pair of two storey semi-detached brick stores and dwellings will be erected by Henry Nixon of this city.

J. W. Fowler will build a two storey brick store on College street at a cost of $3,200.

It is stated that a local business concern has purchased the property on the east side of Yonge street, opposite Agnes street, with the view to the erection of a large store and workshops.

Victoria, B.C.

Harry Maynard has had plans prepared for extensive enlargements to the Silver Spring brewery.

The buildings of the Pacific Club, Bell Piano Agency, K. Colbert, and others were destroyed by fire last week at an estimated loss of $150,000.

W. S. Fraser & Company, hardware merchants, will enlarge their premises at a cost of $9,000.

It is stated that a local syndicate has been formed for the erection of a theatre. The estimated cost is reported to be $100,000.

Vancouver, B.C.

It is understood that the Terminal Steamship Company contemplate establishing a new summer resort on the North Arm.

The Bank of Toronto, will erect a new biulding in this city, but construction will not be commenced this year.

A three-storey block is to be erected on Granville street next to the Tourists' hotel. The block is to be built by Messrs. C. S. Douglas and A. E. Thorley, and is to be ready by August 1st. The contractors are Purdy & Lonergan, and the architects, Parr & Fee, this city. The contract price is $50,000. The building will be constructed of brick with a glazed brick facade. The two upper storeys will each consist of 25 rooms and a parlor, all fitted up in the most modern style, the whole being steam heated and lighted by electricity. Work on the new building is to commence almost immediately.

Townsend & Townsend, architects, this city, are preparing plans for two buildings of brick and stone. There are to be three stores with apartments over in one, and two stores with apartments over in the other.

Parr & Fee, architects, this city, have prepared plans for a four storey office building to be built on Granville street next to the old Finch Page building, on the southwest corner of Robson and Granville streets, for J. M. Cameron.

An option on 2,000 feet of North Vancouver water front, controlled by E. W. McLean, has been taken by out of town people, who are not named, but who are said to want the property for industrial purposes. The price is $120,000, and plans and exhaustive reports are now in the hands of the prospective purchasers. It is reported that the sale is practically consummated, and that the purchasers will proceed at once with plans for the erection of an extensive manufacturing and shipping plant.

The announcement is made that the Canadian Pacific Railway Company will erect shops here for building cars and locomotives. F. F. Busteed, this city, is interested.

A large pulpwood and saw mill are to be erected at Powell river, up the Coast, opposite Texada Island, by the Powell River & Construction Company. C. F. Pretty, of this city, one of the principal promoters, is now in St. Paul, completing the financial arrangements.

Plans for the new Exchange block, estimated to cost $75,000, have been filed with Building Inspector Jarrett. J. S. Helyer, architect.

Crowe & Wilson have obtained a permit for a four storey building to be erected on Hastings street at a cost of $30,000.

A permit has been issued to C. E. Robertson for a brick block on Hastings street east to cost $12,000.

Welland, Ont.

E. A. Fultz, of Lancaster, Ohio, was recently in town making enquiries with a view to establishing a glass factory.

Winnipeg, Man.

W. H. Gardner, of this city, is said to have plans for the erection of a $40,000 block on Portage avenue.

The Queen's Hotel will be enlarged at an estimated cost of $75,000.

A new five storey warehouse will be erected on James street east by E. F. Hutchins.

J. H. Russell, architect, is making good progress with the plans for the new Royal Bank building, to be erected on the site of the old Imperial store.

Plans for the new Royal Bank building are stated to be completed.

Mr. H. H. Millman, financial agent, of this city, will erect a large block at the corner of Osborne street and River avenue. Plans have been prepared and it is expected that work will be commenced shortly.

Yarmouth, N.S.

H. B. Cann, President of the new Burrell-Johnson Iron Company, states that it is the intention of the company to rebuild the machine shops destroyed by fire recently. It will be a few weeks before the directors decide definitely on plans for the new buildings, whether of brick or concrete.

AWARDED.

New Westminster, B.C.

Townsend & Townsend, architect, Vancouver, have received tenders for a store and apartment building to be erected on Lytton square for Mrs. P. Thompson. The contract has been awarded to Adams Bros., contractors, of Vancouver.

Winnipeg, Man.

The contract for the new Canada Permanent block on Garry street has been let to Charles W. Sharpe for $68,500. The new building will be three storeys high.

Work will be started at once. J. H. Atchison, of this city, is the architect.

Welland, Ont.
The contract for the proposed buildings of the Welland Stove Works has been awarded to M. Vanderburg. Architect, T. L. Nichols.

Power Plants, Electricity and Telephones

Brandon, Man.
A committee is investigating the proposal to make an agreement with the Winnipeg authorities for power to be supplied over a long distance cable.

Belle Plaine, Sask.
Tenders will be received until April 15th, 1909, for the construction of the Stony Beach Rural Telephone Company's telephone lines. All material will be supplied, and the poles distributed. Address, John Poyster, Secretary-Treasurer.

Cobalt, Ont.
The Fire, Water and Light Committee have under consideration the construction of a municipal power plant for light and power supply.

Fraserville, Que.
The citizens are considering the question of remodeling the municipal electric light plant, and propose to install two water wheels and dynamos, with a total rating of 450 kw., with switchboard. M. Deschines is secretary and treasurer.

Hamilton, Ont.
The Toronto & Hamilton Electric Railway Company is about to open negotiations for an entrance into Hamilton, and it is believed that the construction work is to be gone on with at once. Allan H. Royce, the company's solicitor, will send an engineer to Hamilton at once to take the matter up.

Plans are being made for the proposed rearrangement of arc lamps, under the new contract beginning July 1st, 1909. The new plans call for 730 lamps. The present system includes 242 electric arc lamps and 279 gas lamps. Under the new contract the gas lamps will be discarded.

Kamloops, B.C.
The general scheme for the reorganization of the civic light and power department recently laid before the city council involves an expenditure of $16,500. This includes the purchase of a compound direct engine with a capacity of 150 kw., costing $9,000, a 120 kw. dynamo indirect, $3,200; 150 h.p. boiler at $2,100, new wiring, $2,200, contingencies, $1,000.

North Battleford, Sask.
It is stated that Messrs. Smith, Snyder and McLeay, of Gravenhurst, Waterloo and Watford, have made propositions to the town with a view to getting a franchise for the installation of a lighting system.

Orangeville, Ont.
Tenders will shortly be taken by Smith, Kerry & Chace, consulting engineers, Toronto, for the construction of the power house for the Dufferin Light & Power Company. The power house will contain three 150 kw. hydraulic units with step-up transformers to a transmission voltage of 22,000 volts. The power house will be situated on the Prince of Wales road, on the Pine river, twenty-four miles from this town. Power will be transmitted for light and power to Shelburne and Orangeville. It is hoped to have the system in operation by the end of this summer.

Ottawa, Ont.
The Ottawa Electric Railway will construct several extensions this summer. Among the lines to be relaid with heavier rails this summer are: Somerset street, from Bronson to Holland avenue; Rockliffe from Princess avenue to the terminus; and Sparks street, in the event of it being repaved.

Montreal, Que.
There is a bill before the Quebec Legislature to grant the Canadian Light and Power Company a charter to carry on operations in this city.

G. F. Greenwood, of Montreal, is president of the Mexican Northern Electric Company, of Canada, which proposes constructing an electric power plant on the Rio Conchas, a short distance from Parral, to cost about $5,000,000. The initial capacity of the proposed plant will be about 15,000 h.p., and the power generated there will be used for mining and irrigation purposes.

Active operations will be started soon on the Montreal & Southern Counties Railway. E. A. Mumford, Secretary-Treasurer of the Montreal & St. Lambert Terminals Development Company, has announced that the Stanstead Granite Company has been let a contract for 155,000 granite blocks, the same to be used for paving the roadway between the company's rails along Common, Grey Nun and Youville streets. Bids are being invited for laying these blocks, operations to be commenced as soon as the weather will permit during the coming spring. The Montreal & Southern Counties Railway, Mr. Mumford states, will award contracts soon for all the electrical apparatus necessary for an electrical tramway company, which is to be put into operation between McGill street, and the several communities on the South Shore. The tubular steel poles required for this electrical installation have been purchased, together with all the necessary appliances on the bridge and elsewhere. It is reported that the company will utilize the south roadway on the Victoria Jubilee bridge for laying its track. It is possible that this roadway may be widened in the future, so as to permit of a double track, but the requirements of the coming season will be met by laying a single track, supplemented for traffic purposes by two switches, until the company's system is extended to Longueuil, Chambly and other points embraced in the plan of construction. It is announced that operations will shortly be begun on the company's sub-station and car barns at St. Lambert, Que.

Port Arthur, Ont.
The Railway Commissioners will receive bids for rails, ties and other construction material required to complete the double-track of the Port Arthur & Fort William Electric Railway to the Fort William boundary. About 20 miles of new track will be added to the railway during 1909. N. C. Pilcher, Port Arthur, is general manager.

Sydney, N.S.
Antoine A. Richard, McLeod's Mills; J. Telesphore Lambert, St. Ignace; Rev. J. Emery Dufour, Ecadieville, and Jacques B. Goguen, Acadieville, are applying for incorporation as the Acadia Telephone Company, to construct and operate a telephone system in Kent and Northumberland Counties.

Vancouver, B. C.
C. F. Pretty has purchased the timber tract holdings of the Canadian Industrial Company, on the east coast of Vancouver, and propose to install a power plant, pulp and saw mills.

Winnipeg, Man.
Tenders addressed to the Williamson Construction Company, Toronto, will be received until April 13th for construction of concrete footings for steel towers for the Winnipeg transmission system. (See advertisement.)

AWARDED.

Calgary, Alta.
Contracts have been awarded by the Street Railway Company, as follows: Federal Electric Company, Montreal, Que., aluminium, contract price, $4,500. The nearest competitior was the Northwest Electric Company, of Edmonton, whose price was $50 lower. The Northwest Electric Company will furnish the overhead specials for $1,947.90. Wm. Stuart & Company will supply the wooden poles needed for $3,400. Copper bonds will be supplied by the Canadian General Electric Company, Peterborough, Ont., for $5,070.

Erratum.—In our last issue the above news was inadvertently published under Edmonton, Alta.

Campbellford, Ont.
Smith, Kerry & Chace, consulting engineers, Toronto, have awarded the following contracts in connection with the Seymour Power & Electric Company's new plant: Generators, Canadian General Electric Company; transformers, Westinghouse Company; water wheels, William Kennedy Company, Owen Sound.

Nelson, B.C.
The Chalmers Company have been given the contract for the second unit of the city power plant at a cost of $75,000.

Miscellaneous

Brockville, Ont.
C. A. McLean, town treasurer, wants tenders until April 6th for $25,310.80 debentures.

Fernie, B.C.
Tenders addressed to G. H. Boulton, Treasurer, will be received until April 7th for $53,000 debentures issued for following purposes: $15,000, school, 5 per cent., 30 years; $13,000, city hall, 5 per cent., 30 years; $10,000, fire hall, 5 per cent., 30 years; $10,000, sidewalks, 5 per cent., 10 years; $5,000, fire hall equipment, 5 per cent., 10 years.

North Bay, Ont.
Tenders addressed to M. W. Flannery, Treasurer, will be received until April 5th for $19,511.38 local improvement debentures of this town.

Pembroke, Ont.
The Waterworks Committee have received instructions from the Town Council to secure estimates in connection with a new waterworks scheme.

Stony Mountain, Man.
Tenders addressed to A. Saunders, Secretary-Treasurer, will be received until April 22nd for $7,000 debentures issued for the erection of a new school house.

Winnipeg, Man.
Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until April 5th for supply of from 70 to 80 portable voting compartments of either wood, iron or steel, for election purposes. Each tender must be accompanied by design.

AWARDED.

Winnipeg, Man.
The contract for supply of 2,500 to 3,500 tons of asphalt has been awarded to Alloway & Champion at $28.09 per ton of E. grade "Ebano" asphalt.

ESTABLISHED 1886

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In which is incorporated

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The Time for Caution

There is every justification for optimism in connection with the season's prospects, but it is just at this stage that the building trade should tread warily and avoid the pitfalls of previous error. It is sounding no alarminst note to say that injudicious courses in the past have marred seasons of nearly equal promise and that the success of the present building year lies chiefly with ourselves.

Margins of profit were figured more closely in many lines last year than it is the custom to figure. With bettering conditions there will be a natural inclination to attempt to recover the concessions made during the period of depression, but if this is attempted too vigorously, it will have the effect of driving construction to lines which do not quote increases, or else of discouraging new work and thereby limiting the volume to lower levels than would otherwise be the case. Better margins are desirable where they have been depressd unduly by circumstances, but a too abrupt increase, or an attempt at regaining all that has been conceded will have a depressing effect.

Similar, also, will be the effect if there is any extended effort on the part of labor to secure higher wages during the coming season. Labor during the past year did not have the scale cut to any extent in the cities, although it was held to a stricter accountability for results and volume than formerly. But the scale was allowed to remain unchanged, although the employers had to figure more closely and cut down their estimates in order to get work. Now that things are apparently looking better, it will offer a serious check if the season shall start with threats of differences as to wages which will have the effect of giving an uncertainty to the progress of work to be started, or else will result in having to advance the cost in a marked degree.

Too great importance cannot be attached to these matters. Details though they may appear to many, the consideration or the neglect of them may mean all the difference between a good and a bad season.

Concerning "the Lowest Tender"

At a recent conference of supervising engineers a prominent Government official made the following observations upon the custom of accepting the lowest tender:

"When the bids come in I want the local man never to hesitate to throw out unduly low bids. There is nothing more distressing to the department than to deal with a failing contractor. The mere fact that it is the lowest bid gives the presumption that it ought to be accepted, but if any engineer knows that a contractor has made a mistake or is not qualified or is not responsible or is negligent in the method of performing his work, that should be one of the prime conditions to be considered in making a recommendation for or against giving the contract to that contractor. I always want the word 'responsibility' to be given the fullest meaning that the law will allow it. It must be the responsible bidder in every case. Much of our difficulty has been in dealing with men who were not responsible."

In this, there is good, sound common sense, worthy of attention. It is by no means an unfrequent occurrence that a contractor in estimating makes a mistake on his own side and sends in a price that cannot pay him. If the "lowest tender" system is carried out, the contract is awarded to him and either personal loss or the delay of the work, and frequently both, result.

While many contractors are content to abide by this system, certain advantages of which cannot be gainsaid, the successful application of it can only be carried out in conjunction with a careful examination of the bids by a competent official. This, of course, is in regard to public works, but the principles also hold good in municipal and private enterprise.

It may be argued that corruption may increase in the setting aside of this system and in the selection of a responsible contractor to the exclusion of the lowest. Precedent, however, seems to show that corruption has prevailed in spite of systems and regulations, if not because of them, and that, consequently, this consideration has little weight.

The letting of contracts calls for "a fair field and no favor," but no cast iron rule of the lowest bid can be established—nor should it. For while there may be an element of justice in letting a man pay for carelessness or any other cause which makes him submit an unreasonably low figure, such a course often means skimpy work and always means an injustice to the man who has sent in a square bid based upon careful and exhaustive computations.

A Straight Talk to Contractors

The following article is contributed by a reader of the "Contract Record" and contains much seasonable advice:

In estimating for a job some contractors simply look at the plans and say "that job is worth so much," while others sit down and go carefully over the plans and specification, measure up and take a few notes of some of the things that will be required. The former are taking great risks, which do not pay, and the latter are adopting very unsatisfactory methods. Now, a contractor must devote his whole attention to reading off, measuring up and writing down, everything required, even if it takes a longer time than anticipated.

The question is, can he afford the time to do it? Consider the value of the many hours and days contractors spend in taking off quantities, the neglect of their other work, which requires all their attention, the doubtful chance of obtaining the contract, the sleepless nights spent in trying to come to a satisfactory conclusion in their efforts to figure out what it ought to be, and a hundred and one other worries which help to shorten this brief span of life.

Slipshod estimating and guess work has ruined many a good man. A contractor is anxious to get the work and may have inside information that his efforts will be fruitful, but even so, he is liable to overlook something or many things. His familiarity with a particular class of work makes him over-confident. He sends in his tender and it is accepted. Perhaps his was not the lowest, but he honestly believed that he gave a fair, reasonable offer to do the work with a marginal profit. When the work commences and as it advances he discovers that he overlooked the ceiling joists, or didn't reckon on the strapping, or some other items. If only one item be omitted, however small, he is that much the loser. "But," he may say, "what does it matter? I have allowed sufficient elsewhere to cover that." Thus he cuts a piece off the top of his pants to make them longer at the bottom.

Now, no man can figure on a job, no matter how small, without the careful consideration of all the details. It is a very important part of his business, be he carpenter, bricklayer, stonecutter, plasterer, painter, or plumber. Any business identified with the building trade calls into play the best reasoning powers of a skilful man.

When a contractor knows the exact quantity of material that will be required to complete a job he is able to fix his price. He knows what he can buy it for and, as an experienced man, knows how long it will take to work that material, how much for handling, transportation, cutting and waste, insurance, etc., with percentage of general working expenses and profit. Then, and then only, can he tell how much he will gain, and only a systematic method will enable him to do this, and place him in a position to do good work to the satisfaction of the owner, the architect and all concerned. He then impresses the architect with his sincerity and ability, increases his clientele, and improves his banking account, building up an unexcelled reputation and obtaining a lasting advertisement which cannot be secured by any other means.

If a contractor cannot devote the necessary time to do this himself he should employ someone who can. It will be money well invested. The cost is small in comparison and will repay itself many times over.

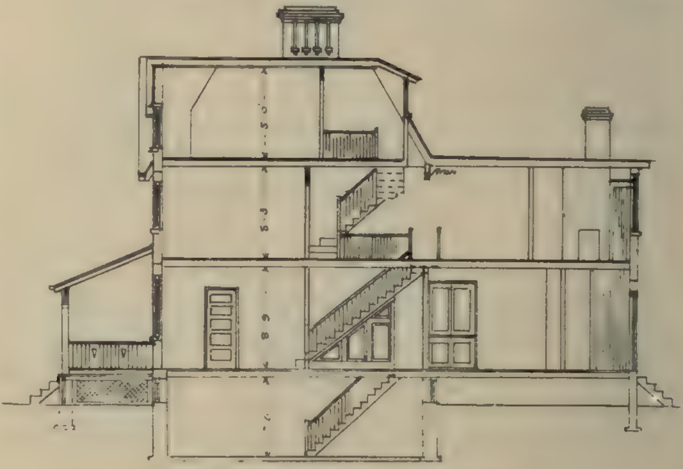
Every good contractor keeps a skilled man for this purpose. It pays him to do so and pays well. With such a man, the contractor can sit down to a schedule of quantities thus prepared and price them item by item. The business becomes a pleasure to him. He knows the state of the market, his stock, his plant and his men. When priced, he hands the schedule to his man for extension, while he himself divides his time between superintending the various works on hand and getting new jobs, returning in time to put the finishing touches to his estimate and preparing his tender.

There are many contractors in a small way of business who cannot afford to employ a man permanently. These, however, will have no difficulty in finding private quantity surveyors willing to undertake the work for a small sum.

J. McL.

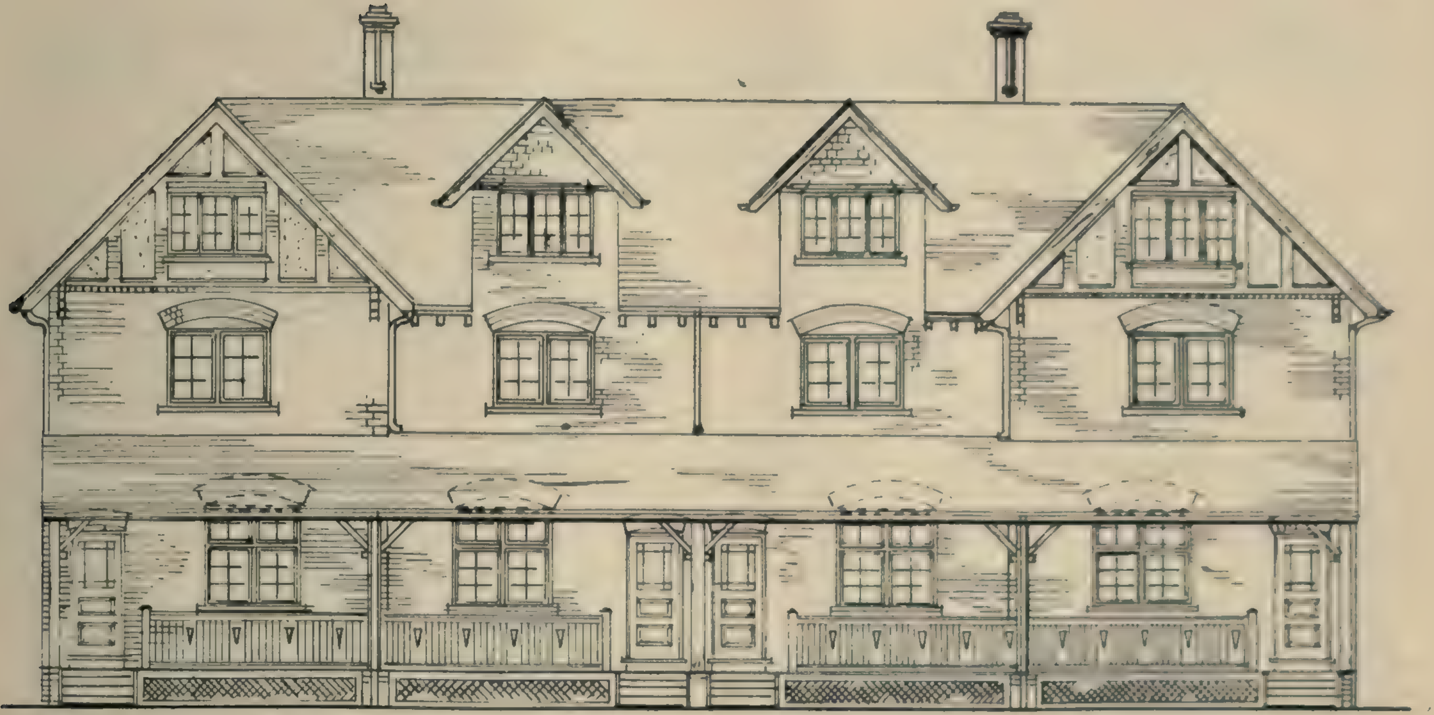
Illustrations—Details and Costs

The accompanying illustrations are plans prepared by Mr. H. Bryan Gilbert, architect, 7 Standard Exchange Building, Toronto, for a block of four workmen's cottages to be erected in a factory district for a manufacturing firm wishing to obviate the necessity on the part of its employees for sub-letting in order to realize the rental. Except for small variations in the end dwellings, the cottages are identical in construction. They will be built of brick, and each one will contain accommodation for a family of eight persons. Provision is made for domestic comfort and convenience. Good cupboard space is allowed for, and the plans provide fireplaces in all the principal rooms on the first and second floors, although these, of course, are more of a luxury than a necessity and may be omitted. The elevations can be treated in a pleasing manner and the cottages erected in pairs.

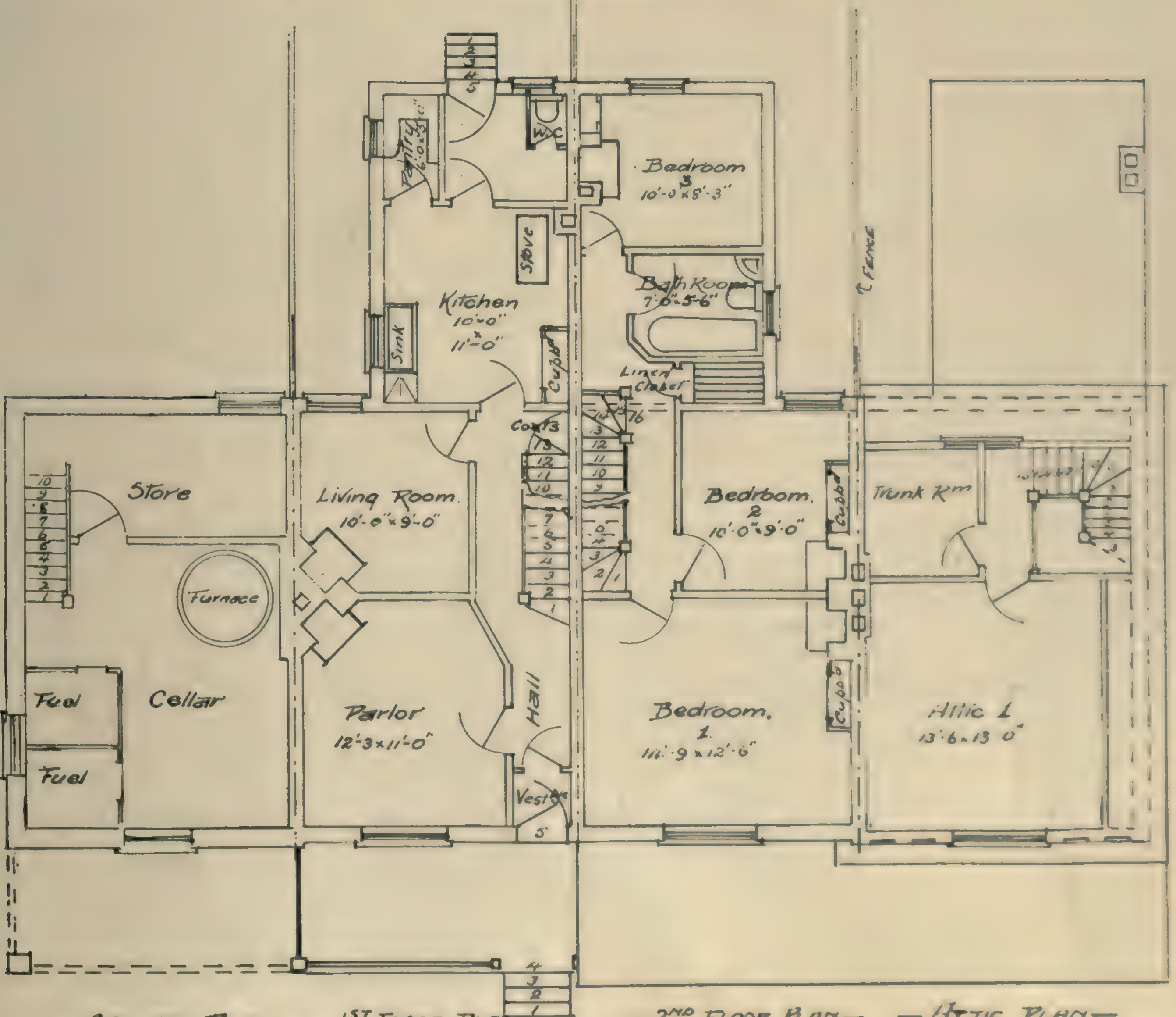


Cross Section Workmen's Cottages

Many prominent manufacturers, whose works are located in country districts, who had hitherto found it difficult to retain good mechanics in their employ owing to the greater attractions of the city, have practically solved the problem by providing at a moderate rental comfortable homes with good-sized gardens. The mechanic earning from $15 to $18 a week can afford to pay $15 a month for rent. In most districts these cottages, inclusive of land, would not cost more than $8 000. The return would be $720 per annum, which is not a bad investment, apart from the other advantages secured to the employer. In both Great Britain and the United States this scheme of building blocks of workmen's cottages has proved most satisfactory.



— FRONT ELEVATION —



—CELLAR PLAN— —1ST FLOOR PLAN— —2ND FLOOR PLAN— —ATTIC PLAN—

Reinforced Concrete in Building Construction

A Review of the Uses of This Material
by Emile J. Perrott, Philadelphia

(Continued from last issue.)

We have had three chimneys constructed of reinforced concrete for buildings designed by our firm, two of which have such a lining, while the third is without a lining, although the owners intend to have one put in.

My reason for recommending an inner lining is not that the concrete is injured by the heat such as is found in an ordinary chimney, but to prevent any disintegration taking place inside the chimney due to injurious gases discharged by the boilers. Should a chimney not be lined and disintegration take place, it might not be noticed in time to repair the damage before a collapse would occur. A very simple way of lining a concrete chimney is by a 1½-inch or 2-inch coat of asbestos cement plaster, applied over wire lath, which is secured to the inside of the outer shell by expansion bolts, this wire lath being set about one inch from the shell to make an air space. If such a lining is used and in course of time becomes damaged, the wire lath can be replastered without removing any reinforcing metal; whereas if a reinforced concrete inner shell four or six inches thick is employed, then when repairs are necessary, this inner shell must be, in whole or part, removed, and either new concrete put in to take its place or plastering must be resorted to. The former method is by far the cheaper and is just as effective. Furthermore, if the wire lath and plaster method is adopted, the outer shell can be erected perfectly plumb and in a straight line from top to bottom, thus doing away with the dangerous effect which has been common in the type of chimney where the inner core is of thick reinforced concrete and does not run the full height.

A chimney which was built for the Salem Laundry, at Salem, Mass., is not built monolithic as is usual, but of concrete blocks having vertical spaces through which the reinforcing rods pass. These spaces were afterwards filled solid with Portland cement mortar, making a solid wall of the blocks. The advantage of using blocks is from the fact that it is possible to inspect each block before using in the work, and any found defective could be rejected, thereby insuring a perfectly sound job.

With the monolithic method, the concrete used in the chimney must be made very dry so that the forms can be shifted in a day and thus permit of their re-use in the section above. This concrete is not as dense as a concrete made wet, and consequently is more porous and not as suitable for reinforced concrete.

Footing for Piers, Columns and Walls.

The most common use of reinforced concrete is for large spread footing under piers and columns, as well as under continuous walls. The use of steel beams for this purpose is much older than reinforced concrete, but the cost of the beams made the use of this type of footing expensive, since the concrete that enveloped the steel beam grillage was not counted upon to take up any stress, only being used as a protection to the steel beams. However, in a reinforced concrete footing, the rods are introduced to reinforce the concrete; that is, to take up the tensile stresses, while the concrete resists the compressive stresses. In the case of piers the rods may be run at right angles, parallel to the sides of the footing or diagonally. In the case of continuous footing having a uniform load per running foot, the main rods across the footing, secondary rods being run parallel to the wall to bond the concrete together. If the load is not continuous on the footing, then a second layer of main reinforcing bars must be used in the top of the footing. Stirrups are not usually necessary in footing.

There are three methods of constructing concrete piles, namely, separately moulded piles; piles moulded in a shell or pipe, which shell or pipe is withdrawn, and piles moulded in a light metal shell or mould sunk in the ground and permitted to remain therein.

For foundations where water is encountered, considerable money and time is saved over pier construction and the permanency of a concrete pile makes it more desirable than a wooden pile.

Reinforced concrete partitions, if made monolithic, can best be constructed by building the forms of matched boards run horizontally and securely fastened to suitable uprights; these forms are kept the proper distance apart by separately moulded separator cement blocks about four inches square, of a length equal to the thickness of the partition, having a ⅝-inch hole cast the length of the block through the centre. These blocks act as spreaders between the two sides of the forms, and should be spaced about one block to every nine square feet of wall, according to the height of the partition. Half-inch bolts pass through the forms and blocks to hold the forms in position. After the concrete has hardened and the forms are removed, these bolt holes are filled up with cement mortar flush with the face of the partition.

Methods of Waterproofing.

There seems to be no better use for concrete than for tanks and reservoirs. There are three general methods of waterproofing concrete.

The first is by adding some ingredient to make it waterproof, either in the form of a dry powder or a liquid, such as Medusa compound, which is a powder and is added in the proportion of about six pounds per barrel of cement. Aquabar is a paste compound, which is mixed with the water with which the concrete is made in the proportion of two gallons of compound to forty-eight gallons of water. Another liquid is Wunner's Bitumen Emulsion, which is mixed usually with a one to two mixture of cement and sand and applied as a coating. The use of powdered hydrate of lime is also effective in making concrete waterproof.

The second method is one in which the concrete after being placed can be waterproofed on the surface with either asphalt, pitch and paper, hydrex or some similar material. This is usually held in place by a second layer of concrete or a brick wall.

The third method is by so grading the aggregates, sand and stone, that the mixture becomes very dense, thus preventing percolation through the material. This latter method is the least reliable, but has been used with very good results in special cases.

The use of reinforced concrete for retaining walls has become more general with the development of the material, and can be used in place of heavy masonry wall at a somewhat less cost. By providing a widespread base and making use of the backing material to add to the weight of the wall ,a very economical wall can be built of reinforced concrete, and a number of such walls have been built. For a vault or cellar walls to resist earth pressure reinforced concrete makes an admirable construction.

Concrete for Decorative Purposes.

We have seen how successfully reinforced concrete has been used as a structural material; how in the engineering world it has taken its place in the fore ranks of the materials used for construction purposes. It remains now for us to consider its adaptability as a material susceptible of decorative treatment, as well as artistic expression.

I will give you an idea of the fundamental basis governing the use of a material for decorative purposes when applied to building construction. The architect's means of expression is by the use of the materials of construction, which must be so moulded and shaped as to give the appearance of solidity; that is, that the building is a concrete reality, that it is solid and substantial in addition to being a thing of beauty. Hence the various shapes that enter into the design must be such as are suitable for the material out of which the part is to be moulded or shaped; it is here that the ability of the skilful designer is shown, since a shape or design that is suitable for one material is very frequently unsuitable for another. We all know that wrought iron can be bent and twisted into all manner of shapes and have a delicacy impossible in a less ductile material, as wood or stone; hence, a suitable design for a wrought iron grill is unsuitable for wood or stone. Now concrete is a plastic material, and its composition can be varied to obtain any desired result in the finished structure; hence, apart from the form it takes, the finish should be an expression of the material.

This brings us to the pith of the subject, and at once suggests how we should treat our exposed surfaces to meet the principal of art. The customary plaster finish on concrete, even if the natural result of the process of moulding, is not a true finish, in so far as truth of expression in art is concerned, since the appearance of a smooth concrete wall is almost the same as a plastered brick wall and gives no suggestion as to the ingredients composing the body of the wall. Hence this character of finish cannot be said as rightly belonging to concrete.

The finishes in which the method of moulding the concrete is apparent, and also the one which exposes the aggregates entering into the composition of the concrete, should be the ones used when the true expressive character of the material is desired.

Apart from the expression of the inherent quality of a material, the effect which it is desired to obtain in any material is paramount to the material itself. So that if the feeling of lightness or heaviness is sought for in the design, the texture of the wall surface should harmonize with this idea. Concrete, being an artificial material, is, therefore, more susceptible to finer shadings of treatment if the aggregate is changed than many natural materials, and the cost is much less.

A very satisfactory method of exposing the aggregates of the concrete is to tool the surface, after the concrete has hardened, thus removing the thin film of neat cement and making a coarse picked surface with the stone or aggregate showing. If the stone is selected for size and color any effect desired can be obtained.

National Association Makes Requests

A deputation from the Canadian National Association of Builders recently waited upon the Minister of Labour at Ottawa to urge the extension of the Lemieux Act to other industries than public utilities, the enactment of a federal law governing compensation for workmen's injuries, and an enlargement of the proposed insurance act to cover industrial insurance.

Mr. J. Herbert Lauer, of Montreal, general secretary of the association, argued that as Mr. Fielding was about to bring in a new insurance bill, the opportunity was afforded for the inclusion of industrial insurance. In regard to compensation for injuries to workmen, he represented that under existing conditions it was impossible for building contractors to estimate their risks in this respect, as the laws were different in all the provinces. The Manitoba and Quebec Governments had decided to appoint royal commissions to look into the question. This expedient had been adopted at Winnipeg after a bill on the subject drafted by the labor union had been thrown out of the Legislature.

Contractors at present were at the mercy of sympathetic juries in the matter of compensation for injuries, and verdicts were usually based, not upon the earning capacity of the injured or deceased, but upon such considerations as the number of his family and his temporal condition. Mr. Lauer advocated a federal act basing compensation upon the earning capacity of the employee for three years and a maximum award of, say, $2,500, claims to be dealt with, not by the courts, but by an official board of arbitration.

Mr. Lauer asked that the operation of the Lemieux Act be extended to include not only public utilities, such as railways and coal mines, but also the building trades, which might be saved thousands of dollars of yearly losses through strikes by compulsory investigations. As for the importance of the building business, he reckoned it as second only to transportation, representing as it did an annual expenditure in the Dominion of some sixty millions of dollars.

Mr. Nesbit, of Quebec, quoted from the "London Standard" an article describing the conditions brought about by the workmen's compensation law of France, which makes an employer liable for the wages of an employee incapacitated by illness lasting over ten days. It had come to this, he said, that if a man wanted ten days' holidays all he had to do was to strike his thumb with a hammer so as to blacken the nail, and get a certificate from one of a certain class of doctors who lived by that sort of practice.

Mr. Lemieux promised that if the act bearing his name was amended, as it probably would be, it would be in the direction of extending the princple of compulsory investigation to other industries than those of public utilities. As for compensation for injuries, it was a matter of civil rights falling wholly within the provincial jurisdiction. "But," he said, "have no fear that Quebec will adopt legislation on the lines of the French law referred to by Mr. Nesbit, so long as my friend and former law partner, Sir Lomer Gouin, is Premier of the province." Mr. Lemieux said as to the proposal that a federal compensation act be passed, he could offer no encouragement.

The delegates composing the deputation were: George A. Crain, president; D. J. MacKenzie, secretary; P. Ackroyd, J. Blythe, W. G. Adamson, John Adamson, H. A. Knox, James Lockie, Ottawa; Wm. Tytler, John Whittaker, George Everett, London; E. T. Nesbit, vice-president, Quebec; E. T. Houghton, H. Simoneau, J. P. Anglin, J. Herbert Lauer, general secretary, Montreal

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Pumps and Their Working Principles

From the earliest ages machines for the raising of water have been in use, and the invention of the common style of pump is generally accredited to Ctesibius, teacher of the celebrated hero of Alexandria, about 224 B.C. The pressure of the atmosphere was not estimated in those times, but it was afterwards determined by Torricelli, the Italian, to be 14.7 pounds per square inch at sea level. At that level the atmosphere will balance a column of water 33 feet 9 inches high.

The action of raising water in a pump is as follows: Suppose the suction tube to be filled with air at the atmospheric pressure, and the water to be at the same level inside the tube and in the well. Suppose the piston or plunger to be at the end of its downward stroke. The raising of the piston will then produce a vacuum below it, and the atmospheric pressure, acting upon the external surface of the liquid, will cause it to rise in the tube or pipe, and follow the upward motion of the piston. The air contained in the suction tube will open the suction valve, and rush into the pump barrel. The elastic force of this air, being then diminished, the atmospheric pressure will cause the water to rise in the tube to such a height that the pressure due to this height will exactly counterbalance the pressure of the atmosphere.

If the piston now descends, the suction valve will close, the water remaining at the level to which it has stroke of the piston, the water will rise still further, been raised, and the air, being compressed in the barrel will open the piston valve and escape. At the next and a fresh portion of air will escape. If the length of the suction is less than about thirty feet, the water will, after a certain number of strokes of the piston, be able to reach the suction valve and rise into the pump barrel. When this point is reached the action changes. The piston in its downward stroke compresses the air, which escapes through it, but the water also passes through, so that the piston, when at the bottom of the pump barrel, will have above it all the water which has previously risen into the barrel. If the piston be now raised, the water will follow it in its upward movement, and fill the pump barrel. With the downward stroke this water will pass up through the piston valve, and with the following upward stroke, it will be discharged at the spout.

This is the basic principle upon which the pump acts. From the time the water enters the pump barrel, at each upward stroke of the piston a volume of water is discharged ,equal to the contents of the pump barrel. In order that the water may be able to rise into the pump barrel, the suction valve muist not be more than 33 feet above the level of the water in the well; otherwise the water would stop at a certain point in the tube, the force of atmospheric pressure being exhausted, and could not be raised higher by any further motion of the piston. Practically, to insure the most efficient service, the pump barrel should not be more than 25 feet above the surface of the water in the well, from which the supply is drawn, but the spout may be more than 33 feet above the barrel, as the water, after rising above the piston, is simply pushed up by the latter, an operation which is independent of atmospheric pressure.

Pumps in which the spout is at a great height above the barrel, are commonly called "life" pumps, but they are not essentially different from the suction pump. Pumps being machines which serve to raise water either by suction, pressure, or by both forces combined, are classed as suction, or life pumps, force pumps and suction and forcing pumps. The various parts of a pump are the barrel, the piston, the valves and the pipe. The barrel is a cylinder of metal, in which the piston is operated by a brake or handle. The piston is a metal cylinder with leather disc or valve, which works, with gentle friction, the whole length of the barrel. The valves are discs of metal or leather, which alternately close the apertures which connect the barrel with the pipe.

A force pump delivers the water under pressure, ejecting it forcibly, or delivering it at an elevation. The single acting force pump is one in which the lift and delivery pump is alternate. The double acting force pump is one in which the passages are duplicated, so that a lift and delivery are obtained by each motion of the plunger. This pump has a distinct water-way both above and below the piston, so as to both draw and force water at each stroke, thus causing a continuous stream, which is rendered more uniform by an air chamber. The object of the air chamber is to provide a cushion of air to give elasticity to the column of water being delivered.

When trying to find a leak in a suction pipe, water will not be found on the outside surface of the pipe, because the air is trying to get in, rather than the water trying to get out. The proper way to locate the leak is to listen for a hissing sound, and this will generally be found where the pipe has chafed against a rough surface, or in a defective joint. When a jerky motion attends the working of the brake, or handle, it usually indicates a leak, unless the suction pipe is very long. When only a partial stream is produced, not equal to the capacity of the pump barrel, the upper valve is partially worn, and requires deadjustment.

As the level of water in wells is subject to changes, it is necessary to construct the rod and cylinder at such a length that the sucker may also work within 26 or 28 feet of the water. By observing this precaution water may be raised by pumps from wells of all depths; because, after it has once entered the barrel, it is raised independently of the atmosphere ,and to any height to which the cylinder is extended. When wishing to raise water higher than the spout of the pump, a lift and force pump must be used. The power or strength to be applied must be greater, and the different parts of the pump stronger, in order to stand the extra strain, as water is heavy, and the 14.7 pounds of atmospheric pressure gives no assistance. In no department of the plumber's work should more care by used than in the arrangement of the pump.—Shoppell's.

Pressure System of Hot Water Heating

Mr. Perry Weber Rathbun, in the "American Carpenter and Builder," declares that the excessive cost of many of the hot water systems of heating is due to the large piping used, to overcome, as it is claimed, friction. He has found, he says, by practical experiments, that, with pressure, either by the use of regulating valves, or mercury appliances, the pipe areas can safely be reduced 50 per cent. and the radiation 15 per cent., with tappings from 60 to 80 per cent. smaller than are used with the old open tank system. The water under pressure can be run up as high as 240 degrees Fahr., without boiling, which gives such a system of hot water heating the efficiency of steam heating, without any of its disadvantages.

A pressure system contains from 25 to 30 per cent. less water than the ordinary hot water system. This reduction causes the plant to be very responsive to firing, thus causing a quicker circulation and overcoming the slowness to heat which is very common with the old-style system. The quickened flow of water over the heated plates of the boiler absorbs heat more rapidly from the fire and delivers it quickly to the radiators which distribute it in the room.

The Anti-Syphon Trap

In an article in the "Plumbers' Trade Journal," Thomas J. Claffy, Assistant Chief Plumbing Inspector of Chicago, Ill., says that the anti-syphon trap has been a source of much controversy among plumbers, and that most of them will insist that it is also a source of much filth. There is no doubt that it has been, and is, a very handy thing in a pinch, but it is also a dangerous thing in the hands of a careless or ignorant mechanic or designer. Manufacturers of anti-syphon traps are too well informed in the principles of dynamics and atmospheric pressure to attempt to controvert any of these principles or laws, and they do not claim impossibilities for their respective traps.

The necessity of thorough ventilation of all soil, waste, and drain lines is acknowledged by every thinking man in the plumbing or engineering line of trade. The necessity of vents to protect traps from losing their water seal by syphonage or concussion is also admitted. Municipalities have, in accordance with these necessities, enacted ordinances requiring the installation of such vent lines as may be necessary to conform with the accepted doctrines, and the details are modified according to climatic and topographic conditions.

If a municipal ordinance requires the protection of the water seal in traps by vent or revent lines of pipe, such vents must be installed. Conditions sometimes prevent the venting of a trap as required by law, but in such cases the proper authority is vested in a board or an individual to grant a dispensation, and permission is given to instal such a trap or contrivance as will attain the end sought by the ordinance which has been dispensed. It would be decidedly unsafe for any municipality to let down the bars promiscuously for the benefit of manufacturers or dealers, and this is the reason for the laws which now govern plumbing installation throughout the land.

We know that traps will syphon, and that capillary attraction and condensation will rob them of their water seals. We also know that concussion, due to flooded sewers or drains or other obstructions, also rob them of their water seals. We know that anti-syphon traps will retain a water seal despite certain efforts to unseal them. But can we prevent concussion, or, in common terms, "back air," from doing so? Certainly not, without the use of a proper vent. Long lines of waste pipe from traps to sewer drain or main waste pipe are sources of foul gases from waste decompositions, which, unless carried off by a vent line, escape through the water seal of the trap, whether it be anti-syphon or otherwise, in the course of time, which means the propagation of disease.

"Back-air" is the most serious menace to the use of anti-syphon traps, and after that come syphonage and fouling. The liability to syphonage is increased as the fouling matter accumulates, because the scouring properties of a trap are more or less restricted by the construction of devices which are depended on to prevent syphonage. "Back-air" or concussion in waste pipes and drains is something impossible to guard against, so long as storm water or excessive flows of sewage must be carried, in any other reasonable and economic manner than that which is in common use, by means of vent and revent pipes.

Home Made Plumbing Jobs

As a general rule it may be set down that it is dangerous for a householder to undertake to do his own plumbing work. It will be far more economical in the end to call in a practical plumber in most cases of trouble. But there are some things which can be done as well by the householder as by the plumber. With a pair of pliers and a monkey wrench anybody can attend to a dripping faucet by putting in a new washer. If the screw of the faucet is worn, that, too, can be replaced with little trouble.

Another common difficulty is the obstruction of the waste pipe of the kitchen sink with accumulated grease. To clear this out is the simplest of propositions. All the water that has accumulated should be baled out at night. Then a mound of potash should be built over the holes leading into the waste pipe. Leave this all night, and the first thing in the morning get a kettle full of water to the boiling point and pour it slowly over the potash. For any ordinary obstruction this treatment will work like a charm.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

96. Agent.—A Scottish firm manufacturing electric, hydraulic, steam and hand lifts, etc., hydraulic presses and pumps, wishes to get into touch with a reliable agent in Canada.

107. Agents.—A Scottish firm manufacturing patent chemical fire extinguishers wishes to appoint agents in Ottawa, Montreal, Toronto, Winnipeg, etc., for the sale of fire buckets, brigade pattern pumps, fire hose, hydrants, couplings, etc.

151. Asbestos fibre.—A London firm wishes to get into touch with manufacturers of asbestos fibre in Canada.

179. Cranes.—A north country company manufacturing cranes and other lifting machinery, also railway plant, would like to get into correspondence with Canadian importers.

182. Steel rails.—A Scotch railway desires to get into communication with Canadian steel rail manufacturers, with a view to purchasing.

240. Agents.—A Belgian firm wishes to appoint first class agents in Eastern and Western Canada for the sale of building materials (iron and steel, wire, barbed fencing wire, zinc sheets, zinc oxide, etc.). Replies to London agent.

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

Sizes, Materials and Shapes of Sewers in the City of Hamilton

By E. G. Barrow, City Engineer

It is at times interesting and profitable, especially for the municipal engineer, to take a peep backward into the early history of a city and carefully examine and consider the character of the engineering works constructed at the commencement of its existence, and then follow step by step the various changes in designs and materials which have taken place from time to time in accordance with the advancement made in engineering knowledge.

The object of this article is not to give an account of the sewerage system of Hamilton, but to demore time than is at present at my disposal, but to describe the various forms and materials of sewers which have been introduced from time to time, pointing out any defects which have been discovered and stating also the cost of each particular class.

At the present time there are 83 miles of sewers in Hamilton.

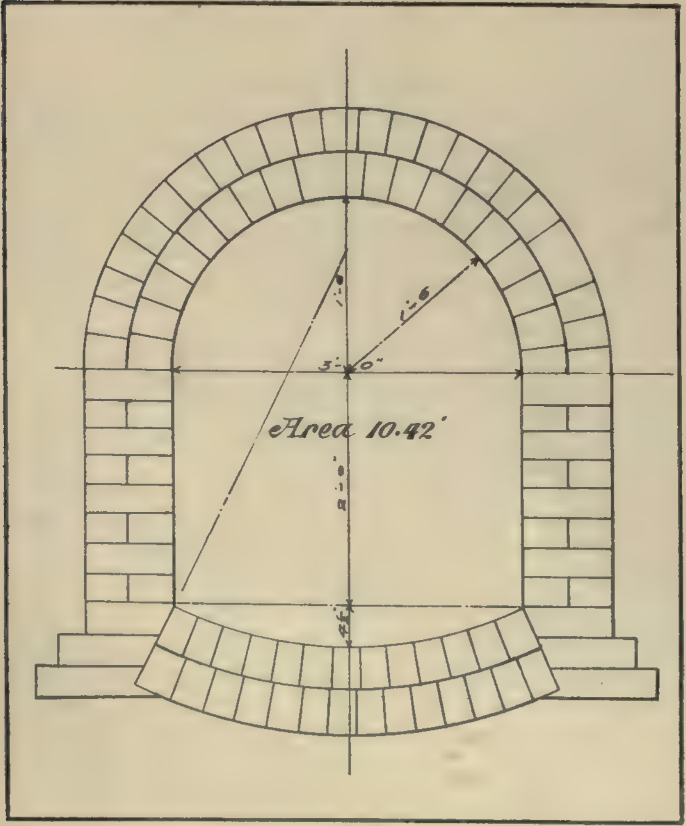
The first sewers built in Hamilton were commenced in the year 1852 and completed in 1857. They consisted of egg-shaped brick sewers and were about 3½ miles in length.

These brick sewers were mostly 4 feet 6 inches by 3 feet. A small portion at the lower end was 5 feet 6 inches by 4 feet 3 inches. The sewers on James and Catharine streets were of the same size and area throughout their entire length, and of late years have become gorged at the lower parts and were totally inadequate to take storm waters. There is no record of how the the size and area of these sewers was determined. The higher part is unnecessarily large and the yower part too small. They were built of brick with ordinary lime mortar. The top part, or crown, of these sewers, and also the sides, are now in a good state of preservation, but the invert has been worn away and has had to be constantly repaired.

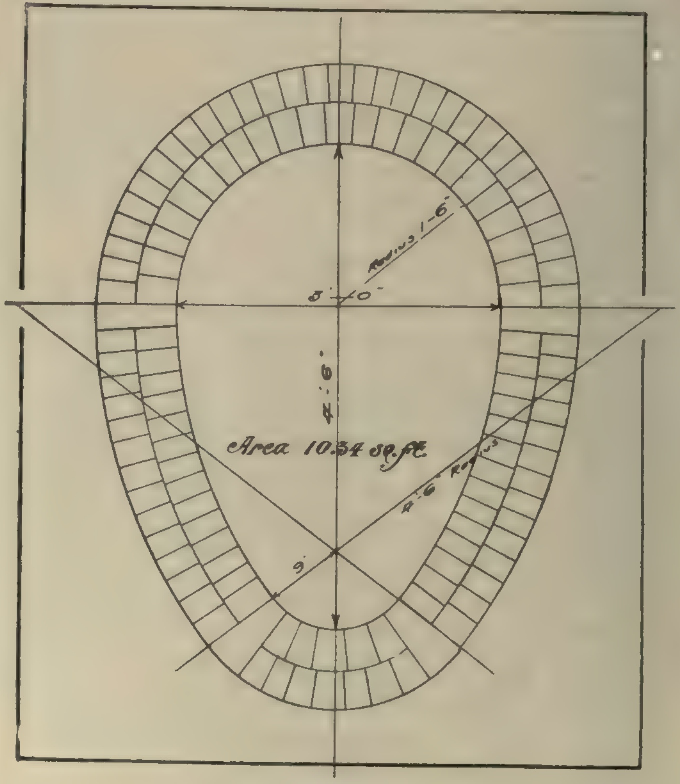
The advantage claimed for the ovi-form shaped sewer is its adaptability for varying flows: i.e., when there is only a small flow the invert of an egg-shaped sewer gives the necessary scour and keeps the sewers cleaner than a round or a wall-sided sewer. Evidently the wearing at the bottom of this class of sewer calls for a harder material than ordinary sewer brick.

It is really wonderful, however, how well the top and sides of these sewers are preserved, being now 60 years old. It has been necessary to relieve these sewers by overflow sewers, and still, during extraordinary rainfalls, they are occasionally gorged. The cost of these sewers was $5.10 per foot and their average depth 13 feet.

The next form of sewer was what is called the wall sided, and was introduced into the system by Mr. Haskins, City Engineer. The first sewer of this class was built in 1889, and formed the trunk sewer for the west end district. The egg-shape form was discarded because



Cross Section of Hamilton Brick Sewer.



The Oviform Sewer.

the ordinary flow was fairly uniform and copious and the inequality of flow for which an egg-shaped sewer is particularly suitable was not present in this case, and by the adoption of the new form a cheaper sewer could be built and the wear of the invert on the egg-shaped sewer avoided. This sewer cost $5.01 per foot and was about 12 feet 6 inches deep. It is in a good state of preservation and the invert is not worn to any appreciable extent. Water lime was the cementing material used.

Vitrified pipe sewers were first laid in 1877 and the joints were made with clay. It was found that the roots of trees, especially the poplar, got into the sewer through these joints and clogged them. There was also a large leakage of sewage at these parts. The above defects led to the introduction of cement joints in the year 1895.

No vitrified pipe sewer larger than 24-inch has been laid in this city, and many engineers consider 15-inch as the largest size they would recommend.

The first concrete sewer was built in 1905 on Sanford avenue, and was circular in form and 8 feet in diameter. It was composed of one part of cement, three parts sand, and five parts gravel. The lower two-thirds of the sewer was built in moulds placed in the trench and the remaining part was constructed above ground in 2-foot lengths. The cost of this sewer was as follows:

	Cost per foot.
Labor moulding top one-third of sewer	$0.29
Labor moulding top two-thirds sewer in place..	0.98
Materials—	
Cement, 1.31 bags	0.655
Cost of centres and moulds	0.149
Gravel, 0.215 cubic yards	0.339
Tools and repairs of same, tow, nails, oil, etc...	0.141
Lumber	0.195
	$2.759
Excavation, 13 feet deep	2.765
Total cost per foot	$5.524

This sewer, built in 1905, is the oldest we have of this material, and sufficient time has not elapsed to pronounce with certainty as to its superiority over brick.

The next concrete sewer was built in 1906 and was 8 feet 6 inches in diameter, circular in form and constructed similarly to that last described on Sanford avenue. A comparative cost of cement and brick sewers of same capacity is here given:

In 1907 a large reinforced concrete sewer was built composing the trunk sewer of an extensive district at the east end of the city.

For a large portion of its length this sewer had very little cover and the following forms were designed to meet the existing conditions. The excavation was in very hard blue clay and could be excavated accurately to the shape of the sewer. The large section cost $10 a foot and the smaller one $7.85.

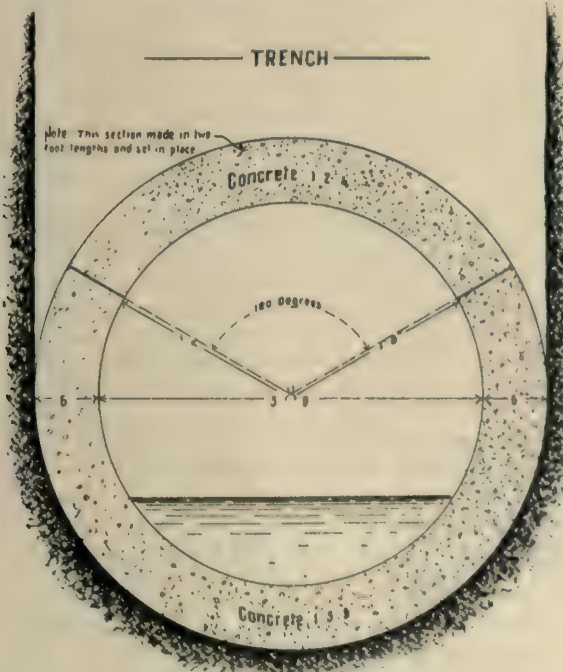
The relative merits of concrete and brick as a material for sewers is now being debated somewhat hotly. Our cement concrete sewers have not been down long enough to judge of their durability.

The experience in Hamilton is that no cast iron rule can be laid down with regard to the shape of a sewer. A study of the surrounding circumstances and conditions will dictate the best form to be adopted.

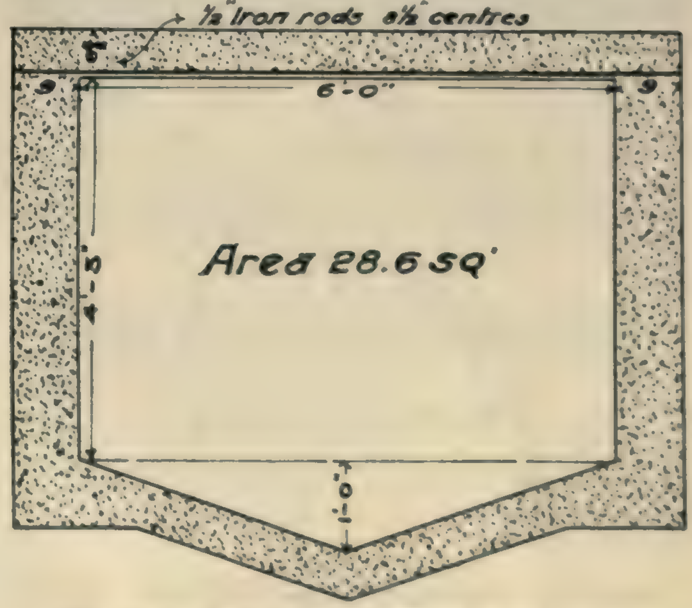
The Hamilton Sewage Disposal Works

The new east-end works at Hamilton are the largest of the kind in Canada and are capable of dealing with 5,000,000 gallons of sewage flow. The dry weather flow at the present time is estimated at about 2¼ million gallons per day. The filter beds are so designed that any part of them can be shut off if so desired, and the capacity of the works being in excess of the sewage flow will not in any way impair the character of the effluent.

The works consists: First, of a detritus well, 25 feet in diameter, into which the main sewer is led. Overflows are provided here in case of an extraordinary rainfall. In this well a revolving screen is situated. Any sand, gravel, paper, orange peels, rags and large substances of that class, are arrested here, partly by screen subsidence and partly by being taken up by the screen. It is intended to have a small incinerator to burn the material taken from the screen. Close to the well is



Cross Section of Concrete Sewer, Sanford Avenue, Hamilton.



Cross Section of Concrete Sewer, Trolley Street, Hamilton.

situated the pump house containing two centrifugal pumps driven by electric motors and capable of pumping six million gallons in 24 hours, the suction pipe of the pumps being connected with the detritus well. The pumps force the sewage through a 20-inch cast iron pipe to the septic tanks, which are two in number, each 76 feet wide, 219 feet long, and 11 feet deep.

The sewage is then conducted through two small roughing filters, which will remove any possibility of suspended matter reaching and clogging the main filters. After passing through this roughing filter it is carried by means of iron pipes to the sprayers—570 in number. The filter bed is 2 3-10 acres in area, and its dimensions 455 feet by 225 feet, composed of furnace slag about 4 feet 6 inches deep. The bottom of the filter slopes lightly towards the sides, and also lengthways to the outlet, and conducts the filtered effluent away in a concrete channel to the bay. The septic tanks are constructed of concrete reinforced by iron, and having buttresses 11 feet apart all around the sides. This is the most approved method of cement construction, and no flaws or cracks of any kind have appeared. The filter beds contain 140,000 cubic yards of filtering material, the tanks 1,694 yards of concrete, and the distributing pipes to the filter consist of 900 feet of 18-inch pipe; 7,000 feet of 6-inch pipe, with 570 standpipes and sprinklers.

Overflow Sewer Under Construction at Hamilton.

Steps are being taken by the Canadian Manufacturers' Association to persuade the Legislature of British Columbia to abolish the Act which prevents extra provincial companies from doing business in the province. The support of the Mountain Lumbermen's Association has been sought in the matter. On account of the advanced state of the session, however, the matter could not be taken up and will now have to stand over until the next session.

Too many men wake up after the procession has passed.

Why Sidewalks Fail

Mr. William M. Kinney, assistant inspecting engineer Universal Portland Cement Company, Chicago, Ill., delivered an instructive address at the recent convention of the Canadian Cement & Concrete Association entitled "Why Sidewalks Fail." Mr. Kinney said that the company with which he is is connected has been engaged for some years upon the study of causes of failures of Portland cement sidewalks, and that they had laid out some 7,000 feet of experimental sidewalk at Buffington, Indiana, from which they hoped to obtain a great quantity of useful information. In the course of his address Mr. Kennedy said:

As you will know, poor materials and poor workmanship cause practically all sidewalk failures. Of these two it can be safely said workmanship is by far the most open to criticism. Poor materials, properly handled may often give very satisfactory results, but careless manipulation of even the best materials usually leads to poor results. When referring to poor materials used for sidewalk construction I mean the aggregate mixed with the cement. We can safely assume, I believe, that when purchased from reliable manufacturers the chances of obtaining a poor quality of cement are small, and particularly when compared with the many classes and conditions of fine and coarse aggregate encountered.

With regard to cement there is one precaution that should be mentioned. Avoid, whenever possible, the use of cement which has been stored so long in a damp warehouse that it has become lumpy. This is particularly advisable when the lumps do not break up easily during the process of mixing. Generally speaking, ageing improves cement, and when kept dry no harm should result from its storage. Very often the lower sacks in a high pile will be hard, but this hardening is due rather to weight than to dampness and the cement flows freely from the sacks. Ths great disadvantage in the use of lumpy cement is its failure to mix readily and its tendency to retard the hardening of the concrete. If the lumps are all broken up and the cement thoroughly intermixed with the aggregate no aparent harm will result. though the hardening process will usually be retarded.

Returning to the question of aggregates, I believe I can state without danger of contradiction that all concrete failures due to the use of poor material can be ultimately traced to the presence in the aggregate of a large quantity of very fine material either in the form of loam, clay, or pulverized stone of some kind. This fine material occurs in two forms, either as dust in the aggregate or as a thin coating on the particles of the aggregate. Preventing, as it does, the covering of the aggregate particles with cement, this coating of fine material is exceptionally injurious to the concrete. Very often because of this condition the mortar has no bond on the larger aggregate and the individual stone may be readily moved. The effect of fine material is most noticeable in the wearing course of a sidewalk or basement floor. The tendency of some walks to wear down in spots and of basement floors to dust up rapidly is undoubtedly due in the main to this cause.

Another manner in which such material interferes with high class work is in the fact that it often delays the hardening process. I have seen cases where the presence of fine loam or clay has delayed the hardening of a walk for several days and in one case entirely prevented its hardening, so that the walk had to be torn up. In the latter case a quantity of the same sand was washed and produced most satisfactory results. It is a safe precaution, therefore, to avoid the use of aggregates containing a large quantity of fine material and if under existing circumstances its use is deemed advisable great care should be exercised to obtain a most thorough mixing.

Turning now to the question of workmanship we find one of the principal causes for failure is the improper construction of the foundation on which the sidewalk is laid. In this connection it is well to bear in mind that the chief usefulness of concrete comes from its compressive rather than its tensile strength, and as any weakening of the support under the walk puts the concrete in tension the necessity for a solid foundation is quite apparent.

The proportioning and mixing of concrete usually receives a good deal of attention so that poor work seldom results from this cause alone. Occurring in combination with some other improper handling it may lead to unsatisfactory results. A common form of poor construction under this heading is the case where a poor base course results from the use of an unscreened gravel which contains too large a quantity of sand as compared with the larger aggregate. Generally speaking, any sand in excess of that required in conjunction with the cement to fill the voids in the larger aggregate has a tendency to materially weaken the resulting mixture. Often by the elimination of a portion of the sand better results can be obtained with less cement. Unless the cement thoroughly covers all particles of the aggregate, poor concrete is bound to result and it is therefore unnecessary to emphasize the need of thorough mixing.

Coming now to the placing of the concrete, the cause which leads to the greatest number of failures is tardy application of the wearing surface. Being but a thin coat of sand cement mixture, its bond with the base course must be of such a character that it can withstand the action of frost and other strains. It is essential, therefore, to apply the wearing course as soon after placing the base as possible. Another type of failure similar to, but not so common as, the above is caused by the combination of a weak base with a good top course. Oftentimes with the best of care the foundation will give way and subject the walk to strain. As a usual thing this does not occur throughout the entire length of the stretch and may occur only in one block. Under such circumstances the advisability of having all the blocks separately constructed can be appreciated and as such conditions are liable to develop at any time it is essential that each block be separated from its neighbor.

A joint should be provided where new walks abut old walks or curbing for unless this is done, failures will surely result. As a general rule unless the stretches of walk are very short these joints should be expansion joints of some sort. The fact that concrete has an expansion coefficient nearly equal to that of steel if often lost sight of by the average sidewalk contractor. The result of this expansion may be the buckling of the walk. This mailure is very common and can be seen almost anywhere in our larger cities. Another form in which this action occurs is when a concrete walk is built against a flag stone curbing. The flag stones are invariably pushed out from their perpendicular alignment.

A form of failure encountered more often in the smaller cities is that due to the building of a walk around trees. Invariably the growth of the tree will crack the walk unless allowance is made for this growth. A form of poor construction most frequently found in small communities, but which can hardly be called a failure, and which at the same time renders the work unsightly, is that work in which an uneven grade is maintained. This is, of course, an error that can be laid to the city engineer in that he did not provide or insist on a uniform grade. Mr. Kinney illustrated his address with a number of interesting lantern slide views.

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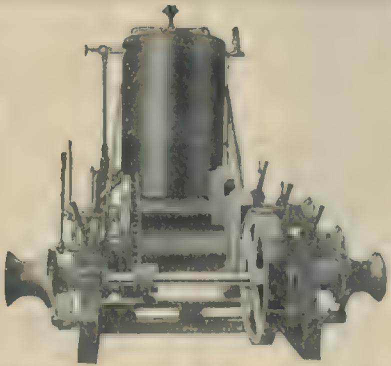

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Facts Concerning Glue

All the glue as received from the factory requires the addition of water before it will melt properly, and every addition of water (while the glue is fresh made), will, up to a certain point, increase its adhesiveness and elasticity; and it is the duty of every man who uses glue to find out just where the point lies, as it is possible to melt glue and have it so thick that after it is dry or set it will be so brittle as not to adhere to the wood. some glue will bear no more water than others, but all will bear more than usually falls to their share, and that, too, with greater increase in the quality of the work, says the "Manufacturer and Builder." For glue to be properly effective it requires to penetrate the pores of the wood, and the more a body of glue penetrates the wood the more substantial the joint will remain. Glue that takes the longest to dry is to be preferred to glues that dry quickly, the slow-drying glues being always the strongest, other things being equal. For general use no method gives such good results as the following: Break the glue up small, put into kettle, cover the glue with water and allow it to soak twelve hours; after soaking boil until done. Then pour into an air-tight box; leave the cover off until cold; then cover up tight. As glue is required cut a portion and melt in the usual way. Expose no more of the made glue to the atmosphere for any length of time than is necessary, as the atmosphere is very destructive to made glue. Never heat made glue in a pot that is subjected to the direct heat or fire or lamp. All such methods of heating glue cannot be condemned in terms too severe. Do not use thick glue for joints on veneering. In all cases work it well into the wood in a similar manner to what painters do with paint. Glue both surfaces of your work, excepting in the case of veneering. Never glue upon hot wood, or use hot tools to veneer with, as the hot wood will absorb all the water in the glue too suddenly and leave only a very small residue with no adhesive power in it.

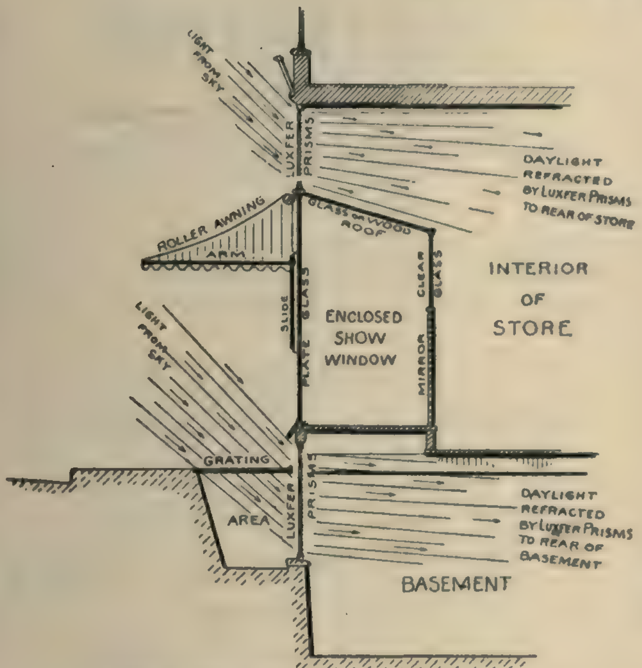
To Safeguard Shippers

The Board of Railway Commissioners has sent out for consideration a draft of an order which it is proposed to issue in connection with the proper safeguards for the handling of shipments of lumber, logs or stone on flat or open cars. There are certain features in the proposed order to which the attention of interested parties has been called, particularly a proposition to penalize shippers for failure to comply with the regulations. The matter is to be gone into at the sitting of the board to be held in Ottawa on April 6th, 1909. The board will be asked to safeguard shippers, in the order, in such a way as to prevent the carriers from imposing any expense upon the public.

The ordinary method employed for the removal of old paint from a building is by scraping or burning it off. The use of soda and quicklime is far more thorough in its results, and the paint is more quickly removed. To make a proper solution of half soda and half quicklime, the soda is dissolved in water, and the lime added. The solution can be applied with a brush to the old paint, and in a few minutes it will remove the coat of paint, which may be washed off with hot water. This method of removal leaves the surface in a better condition than when the paint is burned or scraped off, and is infinitely preferable for large surfaces of paint work.

No man ever acquired a lasting brand of popularity by knocking.

There's Nothing "Just as Good" as LUXFER!



Showing general effect of light reflected through store transom and basement Windows

Luxfer Prisms are manufactured with extreme care and along absolutely scientific lines. There is nothing else "Just as Good". If a building can be daylighted as desired, Luxfer will do it. Do not hesitate to have one of our staff see you about your lighting problem. If Luxfer will not solve it we will tell you so frankly.

Luxfer-Prism Co.
Limited
100 King Street W., TORONTO

Neptune Meter Company

Manufacturers of the Well-known

TRIDENT Frost-Proof Water Meters

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New York City

AMHERST RED STONE QUARRY CO.
AMHERST - N. S.

Amherst Red Stone

Samples sent Free   Hardens with Age   Correspondence Requested

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JAMES BRODIE & CO.
Quarriers and Manufacturers of

Canadian Quinsy, Ebony and Stanstead Granite

Monumental Building, Curbing, Paving, etc.   Rough Stock a Specialty
IBERVILLE, QUE.

Tenders

A few dollars spent in advertising your proposals in

The Contract Record

would result in additional competition, which might save your city or town or your client many hundreds of dollars.

The S. Knechtel Wood Turning Co.

for

Mouldings

EMBOSSED—A stock of patterns in **White Oak** and **Birch** always on hand. Any other wood made up to order.

PLAIN——In a large variety of patterns. All Mouldings of this kind are made to order. Only first and second kiln dried lumber is used in these goods.

CARVED—Not stamped or pressed but carved in solid wood. We have a great many fine designs to use in this line.

All orders can be shipped without delay. Special facilities for shipping to Western Canada and Maritime Provinces.

The

S. Knechtel Wood Turning Co.

Southampton, Ontario

Credit to the Contractor

who uses

"Empire" Brand

HARDWOOD FLOORING

The contractor who has used our Flooring, has been highly satisfied because it has reflected credit upon him, as it has upon the manufacturers.

The careful process of preparation has made the **"Empire" Brand** as fine a flooring as is made. It has become

"Good Enough for a Palace Not Too Good for a Cottage"

Prices will be gladly given on Flooring, Doors and other building materials

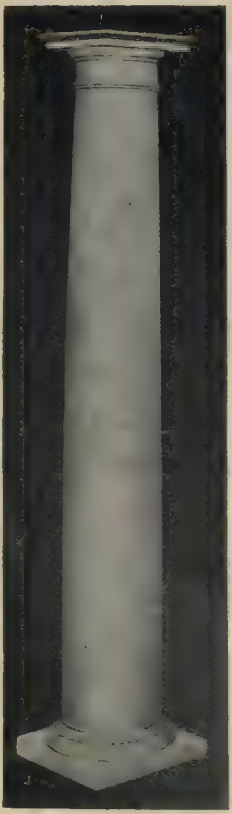
J. R. Eaton & Sons

Orillia, Ontario

Toronto Agent: A. A. Begg, 45 Howland Avenue

Montreal Agent: C. A. Spencer, 55 St. Francois-Xavier St.

Telephone Main 5554



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Our goods are well made and please the most particular buyers. Try us for

Staved Columns

Veneered Doors

Newel Posts Etc.

We give careful attention to details.

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48 Pacific Avenue

West Toronto

Wilson Bros.'

Hardwood Flooring

is made to satisfy the trade that is critical and wants a product just a little better than the usual run.

We Make Close Prices

on all kinds of Dressed Lumber, Doors, Sashes and Interior Finish. Do not hesitate to test us on a hurry-up order.

Wilson Bros., Limited

Collingwood, Ont.

T. H. HANCOCK

1372 Bloor Street West - - TORONTO

Lumber, Sashes and Doors
Interior Finish,
Hardwood Flooring

Our departments are specially equipped for any of the above lines. Send on your requirements. Long Distance Telephone.

We Manufacture the Highest Grade

Hardwood Flooring

That can be Produced Anywhere

DIAMOND BRAND
MANUFACTURED BY
SIEMON BROS. Limited
WIARTON, ONT.
CANADA
HARDWOOD FLOORING

We have the only machinery in Canada that can make an absolute even surface on top.

All our flooring is smoothed NOT SCRAPED. Tongue and groove hollow backed, bored and bundled.

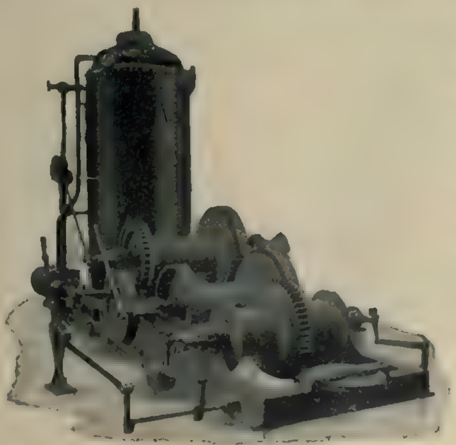
We carry 500,000 feet of flooring in our warehouses ready to ship.

Write to **Siemon Bros. Limited**
Wiarton, Ont., Canada
309 - 10 - 11 Confederation Life Building, TORONTO

We carry all sizes of

The "Midland"
Hoisting Engine

in Stock. **With and Without Boilers**



Derrick Irons of every description

Our latest Catalog tells all about our **Special Builders' Engine** on page 11. Send for one

Georgian Bay Engineering Works
Midland P.O. Box 425. Ontario

John B. Smith & Sons Limited
TORONTO

—Pine and Oak—.
Bill Stuff
— In Long and Large Sizes —

Interior Woodwork of Superior Quality for High-Class Buildings

Established 1851

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Office Fittings

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THE GREEK IONIC CAPITAL
is another style of our stock of Compo-Ornaments, which can be made to match any wood and a the same time look and endure like the real hand carving.

McCORMACK & CARROLL, 82 Adelaide St. E., Toronto

WIRE ROPE

All Kinds and Sizes and for All Purposes.
Standard and Lang's Patent Lay.

Prices Right Prompt Shipments Rope Fittings Rope Grease

The **B. Greening Wire Co.** Limited
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S. S. SELMAN, President
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CANADIAN PIPE COMPANY LTD.
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GALVANIZED WIRE WOUND and Continuous Stave WOODEN PIPE
FOR WATERWORKS SYSTEMS
We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The "L & K" Test Boring
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Light Well Sinking Machine

Operating in Kingston Harbor

When you estimate a foundation for construction do you know how far to go to reach a solid formation? If not send for catalog.

Used by the
DOMINION GOVERNMENT ENGINEERS
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We also manufacture FREIGHT ELEVATORS, CONTRACTORS' HOISTS, GAS AND GASOLINE ENGINES, AND SPECIAL MACHINERY.

The Scott Machine Company
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making extensions to, or installing systems of Water Works, should send us their inquiries regarding Hydrants, Valves and Valve Boxes.

We are specialists in the manufacture of these goods and our prices are right.

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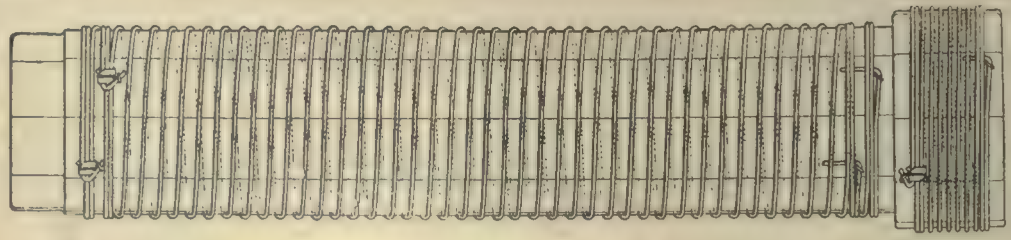

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The Dominion Wire Wound Wood Water Pipe

Showing special method of winding with two independent parallel wires. The great advantage of this is that in event of one wire becoming damaged the pipe still retains a factor of safety of 2. 5. Made only by

The Dominion Wood Pipe Company, Limited New Westminster, B.C.

Also Manufacturers of Continuous Stave Pipe for Irrigation and Power Purposes. Write for Catalogue.

JAMES THOMSON, President. J. G. ALLAN, VICE-PRESIDENT, JAMES A. THOMSON, Secretary. ALEX. L GARTSHORE, Treasurer.

THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
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CAST IRON PIPE

Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

Patent Turbine Pumps

Stage Turbine Pump Electric Motor and High Speed Steam Engine Built for the Montreal Water and Power Co., to do 4,520 Imperial gallons a minute against 300 feet head Overall Eff. 70%.

Kortung two Cycle Gas Engines,
Gravity and Pressure Filters,
Water Softening Apparatus,
Electrical Machines

Built by
MATHER & PLATT, Limited, Manchester, Eng.

DRUMMOND McCALL & CO., Montreal

Our Duplex Catch Basin

Has been recommended by eminent Engineers as the **most convenient for Gutter Work.** Can be adjusted to different heights and is easily placed.

We also Make
Manhole Covers and Frames
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THE R. McDougall Co., LIMITED
GALT, CANADA

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Special Castings
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SMALL DIAMETER WHEELS AND CASTINGS FOR CONTRACTORS. CAR WHEELS. CASTINGS OF ALL KINDS

WORKS AT:
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HARD-WALL PLASTER
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Patent Rock Wall Plaster

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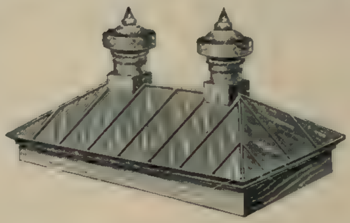
Metal Skylights



Our ACORN System of Skylight Construction gives the greatest strength and the maximum of lighting surface, at the same time. We can quote tempting prices on these Skylights, which have been used on some of the largest jobs in Canada.

Write us about our ACORN system, and we will send you literature telling all about our Skylights.

Metal Shingle & Siding Co.
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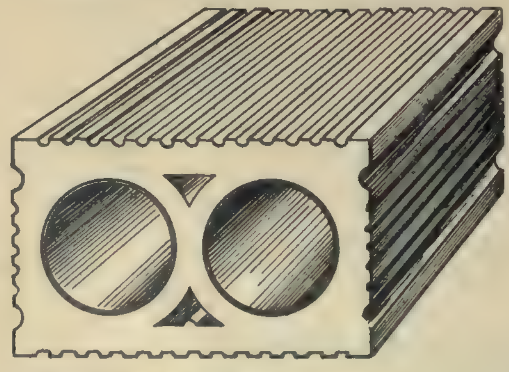
Preston and Montreal

"Faber System"

Longspan Reinforced Hollow-Tile

FLOORING Light and Strong



Sound Deadening and Insulating.
Spans up to 40 ft. by 80 ft. without beams.
The Best and Cheapest Fireproof Flooring on the market.
Supersedes all others.

FOR FURTHER PARTICULARS APPLY TO

The Canadian Fireproofing Co.
Operating under Faber Patents for the Dominion of Canada.
No. 113 Fleurie Street - QUEBEC, Canada
WANTED—Correspondents in all large cities in the Dominion

HERRINGBONE
METAL LATH

which lays up without lap, goes about eight per cent. farther, and is, from this one feature alone worth about eight per cent. more than lath which laps in laying up. The Herringbone selvage edge avoids side lap. We give you without billing it 1½ in. additional length to provide for end lap.

How much lath is wasted in lap with the brand you are using? Your profits depend on your knowing. Then ***find out.***

Herringbone has other good features.

CLARENCE W. NOBLE,
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METAL SHINGLE & SIDING CO. - Manufacturers

Largest of the kind in Canada

Factory of Brantford Roofing Co., Limited

Do Not Confuse

"Brantford Roofing"

with the ordinary **Tar Paper kind. "Brantford Roofing"** is a distinctly superior article. The basis is of Pure Wool Felt, saturated with asphalt by modern methods, producing a Waterproof, Fireproof and Acidproof material.

"Brantford Roofing" comprises three Grades, viz:

"Brantford Asphalt," "Brantford Rubber," and "Crystal"

Approximate weights:

No.	1	Asphalt	60 lbs.	per	square,	108	square	feet.
"	2	"	70	"	"	"	"	"
"	3	"	80	"	"	"	"	"
"	1	Rubber	40	"	"	"	"	"
"	2	"	50	"	"	"	"	"
"	3	"	60	"	"	"	"	"
Crystal			90	"	"	"	"	"

put up in rolls 32 inches wide, 40 feet 6 inches long protected by our Patent Metal Ends. **Nails and Cement in the core of each roll ready to lay.**

A **"Brantford Specification"** for a flat roof, means asphalt or rubber laid on a roof by our own roofers, **Double,** or fifteen inches to the weather with a seventeen inch lap thoroughly cemented and nailed, with a top coating of our Superior Roof Paint, **Guaranteed.**

"Brantford Roofing" as a top covering for Portland Cement Roof. Portland Cement will absorb moisture, **"Brantford Roofing" will not.** By using our **Branroco Lap Cement** a perfect adhesion is obtained.

Estimates furnished on application on architects **Blue Prints. "Brantford Roofing"** is accepted in **Toronto** by City architect.

Brantford Roofing Co., Limited

Brantford, Canada

LOOK!

We have made arrangements to have Crushed Stone always on hand at the Yards of the Ontario Lime Association, Toronto, as follows:

Esplanade & West Market.	**Yonge St. North, C.P.R. Tracks.**	**Queen St. Subway, Parkdale**
Pape Ave., near G.T.R. Tracks.	**Christie St., near C.P.R. Tracks.**	**Weston Rd., near Dundas, W. Toronto**

This should insure a constant supply for all our customers
Prompt Shipments via C. P. R. and G. T. R.

Phone Main 5377 or Write

Christie, Henderson & Co., Limited
Head Office: **34 Yonge Street, Toronto**

Building Material

Write Us for Prices on

Doors, Frames and Sash
Hardwood and Pine Flooring
Interior Finish of All Kinds
Rough and Dressed Lumber
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Try a firm that can supply everything in the line of building material, and save trouble, time and money by dealing in one place.

Georgian Bay Shook Mills, Limited
Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Brantford, Ont.

Bulk and separate tenders for work on the County Court House will be received up to Friday, April 16th, by A. E. Watts, County Clerk. (See Advertisement.)

Cobalt, Ont.

Galt & Smith, consulting engineers, 23 Jordan street, Toronto, have been retained by the town to report on sewerage system and water supply.

New Westminster, B.C.

The city intends to spend considerable money on the improvement of Columbia street. It is proposed to lay a new water pipe on the south side. The Westminster Gas Company intends to lay new mains on either side and the Royal City Gas Improvement Company also asks powers for the same purpose. New sewers are to be laid and new sidewalks put down, while the British Columbia Electric Railway will replace the present 40-lb. rails with 60-lb.

Ottawa, Ont.

Judgment is expected to be given shortly by the provincial secretary concerning the Ottawa South drainage appeal. Meanwhile everything is ready to go on with the the work, which would cover nearly every street in the district. The estimated cost is $40,000.

Peterborough, Ont.

The ratepayers have approved a bylaw to raise $120,000 by debentures to build a new waterworks dam and increase the pumping capacity.

Prince Albert, Sask.

C. O. Davidson, secretary-treasurer, will receive tenders until April 30th for laying of water pipes. (See advertisement.)

St. Catharines, Ont.

Tenders are invited until April 15th for street paving. (See advertisement.)

Toronto, Ont.

Tenders addressed to Joseph Oliver, Chairman, Board of Control, will be received until April 19th for concrete paving required at the wagon house on Agnes street. Plans and specifications may be seen at the office of the City Architect.

The City Engineer's Department will require $190,000 to extend the city water service along St. Clair, Danforth, Riverdale and Carlaw avenue, and along Gerrard street east from the present terminus of the existing main. The money will be provided by an issue of debentures.

Winnipeg, Man.

Tenders are called for the construction of a water main on Strathcona, from the end of the present main to Ellice avenue.

The Board of Works will recommend the asphalting of William avenue, full width, from Charlotte to Nena street at an estimated cost of $68,005.

The Board of Control have several important paving works under consideration.

The following sewers have been placed on the order form for construction: Hespeler avenue, from Birds Hill road to Glenwood crescent; Glenwood crescent, from Hespeler to Hart; Birde Hill road, from Poplar avenue to north city limits; Arlington street, from Yarwood to Notre Dame; Brant, from Elgin to Alexander; Crawford avenue, from Mae to Scotia.

Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until April 8th for sewer construction in Machray avenue, from Main street to St. Cross street. Tenders at office of H. N. Ruttan, City Engineer.

AWARDED.

Berlin, Ont.

The Sewage Commission of the town of Berlin have awarded contracts as follows: Allan Shoemaker & Company, Berlin, Portland cement, $1.55 per barrell delivered; Philip Gies, Berlin, manhole castings, $2.40 per 100 lbs. delivered. The tender for the sewer pipe has not yet been awarded.

Montreal, Que.

At a recent meeting of the Road Committee, the tender of Leger & Company for rough stone, to be dressed into curbs by the city, at 25 and 30 cents a foot, was accepted. Prices submitted for the supply of curbstones were as follows: O. Mandeville, straight, 43 cents per foot; curved 53 cents per foot. Latreille Bros., straight, 50 cents per foot; curved, 60 cents per foot. H. Crevier, straight, 46 cents per foot; curved, 56 cents per foot. Sicily Asphalt Company, straight, 98 cents per foot; curved, $1.05 per foot. Picard & Valin, straight, 48 cents per foot; curved, 58 cents per foot. Leger & Company, straight, 45 cents per foot; curved, 55 cents per foot. It was decided to pay as high as 48 cents for straight and 58 cents for curved curbs.

Toronto, Ont.

The Rogers Supply Company, Toronto, report the following among recent sales of Hadsel mixers: One half-yard Hadsel to the Roadways Branch of the City Engineer's Department, Toronto, for street work, and one half-yard Hadsel to the Construction and Paving Company, Toronto.

Winnipeg, Man.

Tenders were recommended for the construction of sewers as follows, each being the lowest for the work specified: Birds Hill road, Poplar to north city limits, Thos. Jackson & Sons, $5,380.56; Hespeler avenue, from Birds Hill road to Glenwood crescent, Thos. Jackson, $2,433.50; Brant street, Elgin to Alexander, engineer of construction, $1,226.45; Glenwood crescent, Hespeler to Hart, engineer of construction, $548.97; Crawford avenue, from Mack to Scotia, $1,251.75; Arlington, from Yarwood to Notre Dame, engineer of construction, $737.50.

Railroads, Bridges and Wharves

Dryden, Ont.

$8,000 has been placed in the estimates for the erection of a bridge over the Wabigoon river.

Hamilton, Ont.

The engineers of the Hamilton, Waterloo & Guelph Railway are now at work staking out a route in the vicinity of Galt. Construction will probably be started at an early date.

Montreal, Que.

Steven Lund, a well-known Chicago engineer, is at present in this city with plans for the construction of a large bridge across the St. Lawrence river, from Montreal to St. Helen's island, and from there to Longeuil. Mr. Lund wants either the Provincial or Dominion Government to guarantee bonds covering the cost of the bridge, which is reported to be nearly $7,000,000.

In order to abolish level crossings in Montreal, the G. T. R. have offered to share with the city the cost of raising the tracks, estimated at $4,000,000.

Paulson, B.C.

The Trail Lumber Company, Limited, are about to construct a three mile logging railroad from their mill into their timber limits. It is understood there will be very little grade and a light but fast outfit will be required.

AWARDED.

St. John, N.B.

The contract for the construction of an extension to the Wiggins wharf has been awarded to Robert Roberts & Son, at $5,601.

Public Buildings, Churches, Schools, etc.

Amherstburg, Ont.

The trustees of Wesley church will probably erect a new parsonage.

Erantford, Ont.

The Ontario Government will make a grant of $4,000 for the new Tuberculosis Hospital. A site has already been donated and $4,000 has been raised by local subscription. The building will cost $14,000.

Calgary, Alta.

The City Council have passed a bylaw to raise $75,000 for a new central fire hall, three substations and some additional apparatus.

Chilliwack, B.C.

Reeve Kickbush and others are applying for incorporation with the view to erecting a hospital. Rev. Canon Hinchcliffe, J. H. Ashwell and T. E. Caskey are interested.

Dominion City, Man.

A new Anglican church will be built in the spring.

Eskasoni, B.C.

Tenders are called by J. D. McLean, Secretary, Department of Indian Affairs, Ottawa, until April 16th for the erection of a frame school building on stone foundation for the Eskasoni Band on their reserve at this place. Plans may be seen at the local post office.

Eburne, B.C.

A new Methodist church will shortly be erected on the corner of Third street and Moosomin avenue.

Galt, Ont.

Tenders will be taken at once for the renovation of the Market Hall.

At a recent meeting of the School Board, the secretary was instructed to write to the Town Council setting forth the need of a six-room addition to the Central school. Estimated cost $15,000.

Hamilton, Ont.

The Public Library Board will ask the City Council to acept the offer of Mr. Carnegie for $75,000 for a new building.

Lakeview, Ont.

Tenders close April 6th with J. A. Sexton for the erection of a new Baptist church at this place. Plans prepared by T. Wooster, architect, Aylmer.

Knowlton, Que.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until April 13th for post office fittings. Plans and specifications may be seen on application to Mr. H. Hunt, Clerk of Works, Public Building, Knowlton, and at the Department of Public Works, Ottawa.

Moose Jaw, Sask.

Tenders will be received by J. D. Simpson, City Clerk, until April 12th for the construction of central fire station. W. A. Elliott, Brandon, Man., architect.

Montreal, Que.

The congregation of Point St. Charles Congregational Church will erect a new building at a cost of $25,000. Operations will be started in the spring.

Authorization for the Montreal General Hospital to issue bonds for the borrowing of $200,000 is asked in a bill presented by Dr. Finnie. This sum is to be devoted to the enlargement of the buildings and the increasing of accommodation for the hospital.

A new post office will be erected at Point St. Charles, the Dominion government having granted a permit for a building to cost $32,000.

New Westminster, B.C.

The council are considering the enlargement of the city hall.

Tenders addressed to F. C. Gamble, Public Works Engineer, Victoria, will be received until April 26th for the erection of a land registry office at this place.

Oak River, Man.

Tenders are invited until April 8th by John Hule, Secretary Treasurer, for the erection of a new brick school in this village.

Oshawa, Ont.

Tenders addressed to M. F. Smith, chairman, School Property Committee, Board of Education, will be received until April 9th for the construction of a four-room addition to the Albert street school. Plans and specifications may be seen at the store of the Burns Company, Oshawa.

Ottawa, Ont.

The Board of Control last week opened competitive plans for the new registry office to be erected in the rear of the city hall on Albert street. Thirteen designs were submitted. Selection was postponed.

The Bank Street Presbyterian Church have purchased a building site.

Work will shortly commence on the new Wesley Methodist Church. Estimated cost $3,000. J. P. MacLaren, architect.

Rev. J. E. Mavety, District Methodist Chairman, states that a committee is looking for a site in the western part of the Glebe suitable for the erection of a new church, also that a committee is considering the erection of a new church in Woodroffe.

Prince Albert, Sask.

The Methodists have purchased a site for a new church and parsonage.

Peterborough, Ont.

The Murray Street Baptists are thinking of building a new church.

Plessisville, Que.

Tenders addressed to N. Tessier, Secretary, Department of Pubilc Works, Ottawa, will be received until April 14th for hot-water heating system for the public building at this place. Plans and specifications may be seen on application to A. Mathieu, Clerk of Works,, Plessisville, and at the Department at Ottawa.

Quebec, Que.

The provincial legislature will be asked to build a new library in this city.

Saskatoon, Sask.

Tenders will be immediately asked for the construction of the new Canadian Northern passenger depot. The work will be proceeded with at the earliest possible moment. The station will be of brick and stone. Estimated cost, $40,000.

Strathcona, Alta.

The Board of Governors of Alberta College are making arrangements to commence the erection of their new building.

Stellarton, N.S.

Application will be made for authority to borrow money for the installation of fire escapes in the schools.

St. Thomas, Ont.

Considerable alterations and improvements will be made at the post office. Work will commence at once.

Stratford, Ont.

The Y. M. C. A. have purchased a site and inaugurated a campaign to raise funds for a new building.

Toronto, Ont.

J. C. Eaton has given a site on St. Clair avenue for a new Methodist church.

The Deer Park Anglicans will erect a new church on their property at the corner of Yonge street and Lawton avenue. It is estimated that the cost will be about $25,000.

The Catholics of East Toronto have purchased a site on the corner of Main street and Ben Lomond avenue and will shortly build.

Application has been made for a permit to erect the Victoria College Library on the southwest corner of Charles street and Queen's Park at a cost of $70,000. The new building will be of brick, with stone trimmings.

It is reported that a syndicate has been formed to take over the Rosedale athletic grounds and expend $100,000 in the erection of grand stands and clubhouse. Mr. Massey Morris, manager of the Toronto branch of the Canadian Bank of Commerce, is said to be interested.

Steps are being taken to fix the location of the new Methodist church in the north end, for which Mr. J. C. Eaton recently presented a site.

The trustees of Christ Church, Deer Park, have been granted a permit to erect a new church at the corner of Yonge street and Lawton avenue at a cost of $20,000, and a permit has also been granted for Fern Avenue Presbyterian Church to erect a new edifice at the corner of Wright avenue and Roncesvalles avenue, at a cost of $40,000.

Victoria, B.C.

There is a project on foot for the erection of a new Anglican theological training college at an estimated cost of $150,000.

West Toronto, Ont.

A deputation from the West Toronto High School Board waited on the Council last week asking them to recommend to the City Council a request of $50,000 for an extension of the institute and other improvements.

Winnipeg, Man.

F. C. Patterson, chairman of the Manitoba Telephone Commission, states that a new exchange will be erected to take care of the increasing business in the western part of the city.

Smith & Bruce, architects, are working on plans for a threatre to seat 1,400 persons.

Tenders close April 7th with Pratt & Ross, architects, this city, for the erection of an amphitheatre for the Winnipeg Horse Show Association.

Smith & Bruce, architects, 261 Fort street, want tenders until April 8th for the superstructure of a theatre on Dufferin avenue. All trades required except excavation and concrete walls of basement.

The C. P. R. will have a model garden this season on their property near Louise bridge. Large green houses will be erected in the fall.

AWARDED.

Ingersoll, Ont.

P. H. Secord & Sons, contractors, Brantford, Ont., have been awarded the contract for the erection of a four-room school at $11,311. Taylor & Taylor, Brantford, architects.

Toronto, Ont.

The Cement Products Company have obtained a contract for the erection of the St. Paul's Lutheran Church. The materials will be broken ashler and artificial stone. Operations will be started at once. Chas. F. Wagner, architect.

Winnipeg, Man.

It is confirmed that Haney, Quinlan & Robertson have the contract for the G.T.P terminals at Winnipeg. The price is $869,000, and work will commence at once.

The Parks Board have awarded to S. B. Ritchie, at $5,182, the contract for the erection of an open air pavilion and two pergolas at Assiniboine Park.

Residences

Hamilton, Ont.

Recent building permits include: David Henry, two brick houses, Stanley avenue, $7,000; Munro & Read, brick house, corner of Aberdeen avenue and Turner avenue, for C. A. Birge, $6,000; E. B. Patterson, brick house, Eastbourne avenue, between Delaware and Poplar avenues, $2,300; Mitchell & Riddell, brick house, Homewood avenue, $4,000.

Ottawa, Ont.

Building permits have been issued as follows: Charles O'Neil, brick veneered dwelling, Chapel street, $3,500; James H. Wilson, double brick veneered dwelling, Gloucester street, $4,000; S. J. Davis, double brick veneered dwelling, Chapel street, $3,200; M. L. Nimmo, brick veneered dwelling, Carling avenue, $3,200; E. S. Cooms, brick veneered dwelling, Aylmer avenue, $3,500; Thomas Dean, two detached dwellings, Second avenue, $2,000 each; A. G. Marshall, brick veneered dwelling, Oakland avenue, $3,500; E. Shuttleworth, brick veneered dwelling, Euclid avenue, $3,500.

Stratford, Ont.

Ireland & Killer, architects, have just taken tenders for a residence for Dr. S. Silcox.

Toronto, Ont.

W. H. Hutchinson has applied for building permits to erect a $9,000 residence on the northwest corner of Scarth road and Rowanwood avenue, and an $8,000 residence at the corner of Roxborough avenue and Chestnut Park road. Both residences will be three storeys high.

Recent building permits include: Rev. J. Bushell, two storey and attic brick dwelling, Brooklyn avenue, $3,200; R. A. Shield, pair semi-detached two storey brick dwellings, Sidney street, $4,800; P. McConvey, three attached two storey and attic brick dwellings, Euclid avenue, $5,000; Walter Stubbings, pair semi-detached two storey and attic brick dwellings, Dovercourt road, $4,300; C. S. Hope, pair semi-detached two storey brick dwellings, Westmoreland avenue, $5,000; Salvation Army, two pair semi-detached two storey brick dwellings, Davenport road, $7,000; G. H. Smith, two and one half storey brick dwelling, Balmoral avenue, $7,000; Thomas A. Duggan, two and one half storey brick dwelling, corner of Geoffrey and Sunnyside avenue, $4,000; W. W. Digby, two and one half storey brick dwelling, Palmerston Boulevarde, $6,000; Rose and Guest, two storey roughcast dwelling, Manning avenue, $2,500; E. A. Stevens, two and one half storey brick dwelling, Cowan avenue, $4,000; W. H. Hutchinson, two and one half storey brick dwelling, corner Scarth road and Rowanwood avenue, $9,000; James McCaffrey, two storey brick dwelling, Albermarle road, $2,500; J. T. and H. Hutson, pair semi-detached two storey and attic brick dwellings, Farnham avenue, $5,000; McCormack estate, addition to stable, Avenue road, $2,800.

Vancouver, B.C.

J. A. Russell will erect a $30,000 residence near the corner of Alberni and Chilco streets.

Wilkie Allan, architect, has plans for a $100,000 apartment house to be erected on Alberni street this spring by a Seattle syndicate.

Recent building permits include: T. J. Lightheart, Robson street, four houses, $13,000; W. J. Fowler, First avenue, four houses, $5,000; Mrs. M. Mills, Second avenue, $2,000; G. Denness, Second avenue, residence, $5,000; Ferguson & Potter, 4th avenue, two houses, $3,000; Mr. McRae, Oxford street, residence, $2,300; MacKinnon & Campbell, Second avenue, residence, $2,000.

Winnipeg, Man.

A large number of houses will be erected this summer in the district west of Home street and south of Portage avenue. Several are now under way.

Thirty houses, of good design and class will be erected in Marlborough Place this summer.

Recent building permits include: George Neil, four dwellings, Machray, $6,000; E. Rosebalt, dwelling, Ashburn, $2,000; Alderson & Smith, residence, Wardlow, $7,000; J. F. Daniels, dwelling, Lipton, $2,000.

Plans are being prepared for a $10,000 residence for G. S. Robertson.

Mr. Hugh Osler will erect a $20,000 residence, of concrete construction, on Wellington crescent. Architect Rugh has nearly completed the plans.

R. J. Mattice has been granted a permit for the erection of a fireproof apartment block, corner of Osborne street and Roslyn road, to cost $205,000. Architect, W. W. Blair.

F. W. Heubach, Limited, will erect a number of residences in Norwood this season.

Recent building permits include: A. J. Greeves, Walnut street, dwelling, $3,500; J. D. Windrum, Wellington crescent, residence, $6,000; C. W. N. Kennedy, west side Pembina, store, $4,000; W. Fleming, dwelling, Walnut street, $4,500; J. R. Struthers, Dundern, residence, $3,000; T. W. Holly, Dundern, residence, $3,000; Mrs. L. Armstrong, Hetherington avenue, residence, $2,000.

Business Buildings and Industrial Plants

Arden, Man.

The building of W. H. Park, hardware merchant, was recently destroyed by fire.

Buchanan, Sask.

The local farmers are organizing for the establishment of a creamery.

Carlisle, Man.

A new elevator will be erected here this season.

Carlyle, Sask.

Tenders addressed to S. J. Kent will be received for the construction of the Farmers' elevator at this place.

Campbellford, Ont.

The Trent Valley Woollen Mills are negotiating with the Council with a view to making extensions.

It is stated that a pulp manufacturing company has decided to locate a plant here.

Eburne, B.C.

Mr. S. Polson, a Winnipeg capitalist, has purchased a large site which it is believed he will use for factory purposes.

R. D. Rorison & Son are starting a sawmill and shingle mill just across the Fraser river from Eburne, at the junction of the Lulu island branch of the British Columbia Electric Railway. The work of getting out the piles for the wharf has already begun. It is estimated that the concern will expend at least $109,000 before the plant is ready for operation. The company own considerable timber limits.

Guelph, Ont.

Business blocks will probably be erected this year by John Crowe, L. E. Rowen and T. H. Gemmell, all of this city.

Halifax, N.S.

The Birchdale summer hotel at the North-West Arm will probably be enlarged this season.

Kenora, Ont.

At a meeting of the Gold Hill Lodge, I. O. O. F., it was decided to erect at a cost of about $15,000, a new block to replace the building recently destroyed by fire. A permanent committee was appointed to secure preliminary plans and specifications.

London, Ont.

The Beltz hat store was recently damaged by fire to the extent of $5,000.

Lyndhurst, Ont.

The cheese factory owned by Mr. Bresse was destroyed by fire last week at a loss of $2,500.

Montreal, Que.

The premises of the Consolidated Lithographing & Manufacturing Company, Limited, were damaged by fire last week; total estimated loss $25,000.

Nanaimo, B.C.

The Vancouver Briquette Company will install a plant in this city at an estimated cost of $80,000.

Nelson, B.C.

Green Bros. & Burden will shortly take tenders for the erection of a new block on Ward street.

J. E. Annable may build a business block this season.

Ottawa, Ont.

A permit has been issued to G. O. Sefert for the erection of a laundry on Wellington street to cost $5,000.

Prince Albert, Sask.

The Agnew Hardware Company will build a business block on Selkirk street.

Plans for the Imperial Bank's new building are stated to be ready.

Port Arthur, Ont.

J. D. Matheson, architect, Winnipeg, has plans for a $25,000 hotel for the C. N. R.

Portage la Prairie, Man.

The implement warehouse of J. W. Lang was destroyed by fire last week at a loss of $1,500.

The Stevens Brick Company are asking for concessions with a view to doubling their plant.

Renfrew, Ont.

The Quebec Bank has purchased a site here for the erection of a building at an estimated cost of $25,000.

St. Boniface, Man.

The Western Canada Flour Mills Company will erect a $20,000 stable.

St. Johns, Nfd.

It is reported that a thousand square miles of limits on the south coast of Newfoundland have been purchased by a New York concern, whose plans are said to provide for the erection of a huge paper plant estimated to cost $10,000,000.

Strathroy, Ont.

J. A. Minchiner and other local people have opened up negotiations with the council with a view to establishing a furniture factory.

Strathcona, Alta.

Tenders close April 7th with R. W. Lines, architect, Edmonton, for the erection of a brick block on Whyte avenue, Strathcona.

Work will shortly commence upon the erection of a butter and cheese factory, estimated to cost $9,000, for the Edmonton City Dairy Company, Limited.

St. Thomas, Ont.

W. E. Idsardi will shortly commence the erection of a two storey brick store on Tolbert street. F. Sutherland, shoe dealer, will also put up a store building.

Tugasko, Sask.

Work will shortly commence upon the construction of a new elevator for the Saskatchewan Western Elevator Company, Limited.

Tofield, Alta.

The buildings of Robert Logan, Mathew McCauley and A. J. McCauley were destroyed by fire last week

(Continued on page 23)

Tenders and For Sale Department

For Sale

Cheap, No. 4 Hot Water Boiler, nearly new. Apply at 91 ROXBOROUGH ST. EAST. Phone North 4296, Toronto. 14

Town of New Liskeard

Waterworks

Tenders will be received by the undersigned until the 15TH DAY OF APRIL, 1909, for the supplying of Cast Iron Water Pipe and other Castings, Valves, Hydrants, and for excavating and refilling Trenches and Laying Pipes, Setting up Hydrants, etc., for the extension of the New Liskeard Waterworks System, there being about seven thousand nine hundred feet of six inch and four inch pipe to lay. Plans specifications of the work, etc., form of agreement and bond may be seen and form of tender may be obtained at the office of C. H. Fullerton, Town Engineer, New Liskeard.

H. HARTMAN,
Clerk.

New Liskeard, March 10, 1909. 15

Temiskaming and Northern Ontario Railway Commission

Sealed tenders addressed to the undersigned and marked on the envelope "Tender" will be received up to 12 o'clock noon on WEDNESDAY THE 14TH APRIL for the following works:—

1. Culvert near Mileage 21½.
2. 5 ft. Arch Culvert near Mileage 50¾.
3. 20 ft. 1 Beam Span near Mileage 62½.

Plans and specifications may be seen at the office of the Secretary-Treasurer, 25 Toronto St., Toronto, or at the office of the Chief Engineer, North Bay.

Forms of tender and amount of deposit necessary in respect of each item can be obtained on application to the Secretary-Treasurer at above address.

Lowest, or any tender, not necessarily accepted.

A. J. McGEE,
Secretary-Treasurer.

25 Toronto St., Toronto,
March 18th, 1909.

Papers inserting this advertisement without authority will not be paid for same. 14

City of Saskatoon, Sask.

Tenders for

Road Making Machinery

Sealed tenders will be received by the City Clerk, until 5 o'clock p.m. on TUESDAY, APRIL 20TH, 1909, for the following:

1. One Stone Crusher of 10 to 20 tons per hour capacity.
2. One Elevator complete.
3. One Set Screens.
4. One Set of Bins.
5. One Ten Ton Road Roller.

For further information apply to the City Clerk.

J. H. TRUSDALE,
City Clerk.

Saskatoon, March 22nd, 1909. 15

To Contractors

Tenders will be received by the undersigned up to THURSDAY, 15TH INST. for all trades required in the erection of a Masonic Temple Building, in West Toronto. Plans and specifications may be seen at the office of the architects. No tender necessarily accepted.

ELLIS & CONNERY, Architects,
14 Manning Chambers, Toronto.

City of Medicine Hat

Tenders for Gas Well

Tenders for the drilling of a well for the city will be received at the office of the undersigned up to APRIL 30TH, 1909.

Tenders to be given as follows: The contractors to furnish all labor, pipe, machinery and material; anchor and sheet in well in a practical manner.

The city to pay for all pipe, which is necessary to leave in the well or the contractor may tender to furnish labor only, anchor and sheet in well in a practical manner.

Specifications may be obtained by applying to undersigned.

W. P. MORRISON,
14 City Commissioner and Engineer.

CITY OF SASKATOON
Province of Saskatchewan

Tenders for

Excavating and Pipelaying

Sealed tenders will be received by the City Clerk until 8 p. m. on TUESDAY, APRIL 13TH, 1909, for all labor necessary for laying Water Mains and Sewer Pipes, and furnishing certain materials therefor according to plans and profiles dated April 1st, 1909.

Plans and specifications may be seen at the office of the Chief Engineer, 103 Bay street, Toronto, or at the office of the City Clerk, Saskatoon, on and after April 1st, 1909.

WM. HOPKINS, Esq., J. H. TRUSDALE, Esq.,
Mayor, Saskatoon. City Clerk, Saskatoon.
WILLIS CHIPMAN, C. E.,
103 Bay street, Toronto, Ont. 15

Tenders Wanted

Sealed Tenders, addressed to the Williamson Construction Co., and marked "Tender for Concrete Footings," will be received at this office until 12 noon, APRIL THE THIRTEENTH, for the supply of forms, material and labor involved in the construction and placing of

Concrete Footings

required for the Steel Towers of the City of Winnipeg Transmission System from Point du Bois to Winnipeg.

Specifications can be seen, and form of tender and other information can be obtained at this office. Tenders will be received at a price per cubic yard of concrete. The successful tenderer will be required to commence work about May the first.

Each tender must be accompanied by a marked cheque for Five Hundred Dollars ($500.00), payable to the order of the undersigned which will be forfeited if the person tendering declines to enter into a contract when called upon to do so. The successful tenderer will be required to furnish a bond in satisfactory sureties in the sum of Three Thousand Dollars, ($3,000.00) for the satisfactory performance of the work.

The lowest or any tender not necessarily accepted.

LAMPORT & FERGUSON, Solicitors,
Canada Life Building,
Toronto, Ont.

The unauthorized insertion of this advertisement will not be paid for. 14

To Paving Contractors

The City of St. Catharines intend paving certain streets and invites final tenders for paving one or more of same either in

Vitrified Brick
Asphalt Block
Sheet Asphalt
Bitulithic
Westrumite

Sealed tenders addressed to the Chairman of the Committee on Works will be received by the City Clerk untill 15TH APRIL, 1909, at noon.

Plans and specifications may be seen and form of tender obtained at the City Engineer's Office on and after 3rd, April.

Each tender must be accompanied by an accepted cheque or cash deposit for the sum of Four Hundred Dollars.

The lowest or any tender not necessarily accepted.

D. BENZIE, C. E.,
City Engineer.

St. Catharines, 31st March, 1909. 15

Underground Cable

Tenders for Underground Cable will be received up till APRIL 30TH by the City of Toronto, Canada. For specifications and form of tender apply Electrical Department, City Hall.

Notice to European firms—For specifications and form of tender apply Preece & Cardew, 8 Queen Anne's Gate, Westminster, London, S.W., England. 14

Tenders Wanted

Bulk and separate tenders for the several branches or trades required for completing proposed alterations or improvements to the County Court House, Brantford, Ont., will be received up to 12 o'clock noon, FRIDAY, APRIL 16TH, 1909.

Plans and specifications may be seen at the office of TAYLOR & TAYLOR, Architects, Hope Chambers, Brantford, Ont.

All tenders shall be sealed and marked "Tender" and addressed to A. E. Watts, Esq., County Clerk, Brantford, Ont.

The lowest or any tender not necessarily accepted.

By order of County Council.

W. T. THOMSON,
14 Chairman of Building and Grounds Committee.

Positions Wanted or Vacant

WANTED ENGINEER. — JAMES PEARS, Brick Manufacturer, Eglinton avenue, North Toronto. 14

BRICKLAYERS WANTED — Apply to JOHN QUINLAN & CO., 324 Peel St., Montreal, Que. 14

FOREMAN WANTED—for extracting stones with derrick. Apply to THEO. GUAY, 38 Eaddie St., Town St. Paul, Que. 14

WANTED—A man to run a Boom Derrick, with an Orange Peel Bucket, in a quarry. G. E. MILLS, 614 King east, Hamilton. 14

WANTED — Competent Engineer to run 100 h.p. Wheelock engine and incandescent and arc light machines; state wages wanted and experience. MOUNT FOREST ELECTRIC LIGHT AND WATER COMPANY, A. Flishie, Secretary. 14

CITY OF PRINCE ALBERT

Tenders

Sealed tenders addressed to the undersigned and marked "Tender for Pipe-laying," will be received until 8 P.M. on FRIDAY, APRIL 30TH, 1909, for the following work.

Taking up 8 inch wooden stave pipe on River Street and First Street, Goschen, between Fifth Avenue East and Graham Street and re-laying with 8 inch Cast Iron Pipe.

Specifications may be seen and forms of tender obtained at the office of the City Engineer.

C. O. DAVIDSON,
Secretary-Treasurer.

Prince Albert, March 25TH, 1909. 1

Tenders Wanted

City of Saskatoon

Sealed tenders addressed to the undersigned will be received until 5 o'clock p.m., WEDNESDAY, APRIL THE 28TH, 1909, for the following:

(a) One Brick, Steel or Concrete Smoke Stack with a height of 100 feet and inside diameter of 66 inches, together with corresponding smoke connection to boilers.

(b) Bricking in 2-250 Horse Power Robb Mumford water tube boilers.

Plans and specifications may be seen at the office of the Electrical Superintendent.

A marked cheque for $100.00 must accompany tender. The lowest or any tender not necessarily accepted.

E. L. WHITE, Electrical Superintendent
J. H. TRUSDALE, City Clerk. 16

Dredge Wanted

The purchase or rental of a clam shell or orange-pool dredge with boom of about one hundred feet, for work near Toronto is contemplated.

Dredge owners are recommended to communicate forthwith with the City Engineer, Toronto, describing plant of such nature which they may wish to rent or sell.

C. H. RUST,
City Engineer.

14

Business Buildings and Industrial Plants

(Continued from page 21)

Toronto, Ont.

An American syndicate which includes Mr. Angus Gordon, formerly assistant-manager of the King Edward hotel, Mr. E. Clark King, manager of the Brighton Beach hotel, Col. H. W. Pratt, of Boston, and H. M. Deyo and J. M. Smart, of New York City, will erect a large new hotel on Yonge street at a total estimated cost of $1,500,000. Plans have already been prepared by Essenwein & Johnson, architects, Buffalo, N.Y. The building will be eleven storeys high. Construction will start within three months.

C. E. Proctor has a permit for the erection of four attached three storey stone and brick stores, corner of Palmerston avenue and College street. Estimated cost, $20,000.

A permit has been issued to Gerhard Heintzman for alterations to store and warehouse at 41 Queen street west at a cost of $4,000.

A permit has been issued to C. S. Boon to erect a two storey and basement warehouse at 94 to 100 Richmond street west, to cost $20,000.

The Standard Sanitary Manufacturing Company, of Pittsburg, Pa., will establish an extensive plant in this city. They state that they will employ 600 hands.

The Freehold Realty Company have obtained a permit for the erection of three attached two storey brick stores and dwellings, corner of Bloor street and Dovercourt road, estimated to cost $9,500.

G. W. Wallace will build a brick store and dwelling on Carlton street at a cost of $6,000.

A. Thompson has a permit for a brick store on Vaughan road to cost $2,500.

J. Pinder will erect a brick store and dwelling on Queen street at a cost of $2,800.

A permit has been issued to the Bell Telephone Company for a concrete and steel office building and exchange on Adelaide street at an estimated cost of $320,000.

The T. Eaton Company have been granted a permit to erect an eight storey and basement factory on the north side of Trinity Square at a cost of $215,000. The building will have a frontage of 100 feet and a depth of 152 feet 6 inches, and will be 167 feet high.

Victoria, B.C.

Maxwell Muir, architect, is stated to have plans for the erection of a large block of two storeys and basement, brick and cement construction, upon the site of the premises now occupied by Watson & McGregor.

Operations will be started this season upon business blocks for Barrett and Dean, this city, A. L. Lavery, this city, and Thomson Bros., Vancouver.

A number of local men will shortly present a proposal to the City Council for a lease of the air space over Lytton square for the purpose of erecting a business block on the Columbia street level, while the market square would be held beneath as usual, the building to be built on iron pillars.

The buildings of the Pacific Club and other structures were recently destroyed by fire at a total estimated loss of from $150,000 to $200,000.

Waxwell Muir, architect, this city, has prepared plans for a modern livery stable to be erected for Cameron & Calwell at an estimated cost of $12,000.

F. M. Rattenbury, architect, this city, has just taken tenders for a brick store building for the British Columbia Electric Railway Company, Limited.

Vancouver, B.C.

The Michigan Pacific Lumber Company, of Grand Rapids, Mich., have purchased extensive limits on Vancouver Island where they will put up a big plant.

The Great West Smelting & Refining Company, of Seattle, Wash., have taken options on several waterfront properties with a view to establishing a plant in this city.

Options on over 250 acres in Burnaby municipality, including half a mile of waterfront on the North Arm of the Fraser river, are stated to have been secured by American capitalists, who are reported to want the property for a flour mill and elevators.

The Traders Bank of Canada will establish a branch in Vancouver.

Jas. A. Moore, of the Moore Iron Works, near Port Townsend, Wash., is negotiating for a site here on which to locate immense iron works, and possibly a steel plant. The investment planned contemplates the initial expenditure of at least half a million dollars.

Woodstock, Ont.

The Council is negotiating with the Watt Hose & Pipe Coupling Manufacturing Company, Limited, in regard to the establishment of a factory.

Welland, Ont.

The saw mill owned by S. Lambert was destroyed by fire last week at a loss of $4,000.

The Bell Telephone Company have just taken tenders for their proposed new office building. Construction will be started at an early date.

The Canadian Bank of Commerce are considering the establishment of a branch bank.

West Toronto, Ont.

The Gurney Foundry Company will extend their plant at a cost of $6,500.

Winnipeg, Man.

The Atlas Elevator Company is reported to have recently secured elevator sites at fifteen points along the line of the G.T.P. Several more are being considered.

A representative of the Siegel Cooper Company, Chicago, was recently in the city negotiating for a site on which to erect a large departmental store.

W. H. Gardiner will build a $45,000 block corner of Portage avenue and Edmonton street.

Smith & Bruce, architects, are preparing plans for a theatre and hotel to be erected in South Winnipeg, at an estimated cost of $100,000.

E. F. Hutchings will build a warehouse, 38 by 100 feet, at a cost of $25,000.

AWARDED.

Belleville, Ont.

The Concrete Engineering & Construction Company, Toronto, have been awarded by the Burrell Rock Drill Company, Limited, the contract for their machine shop, forge shop, storehouse and boiler house. The construction will be the first of its kind in Belleville.

Campbellton, Man.

The contract for the factory and lumber mill of the Nordin Company, to be erected at Tide Head this summer, has been awarded to Mann & Baxter, of this place.

Winnipeg, Man.

C. W. Sharpe has secured the contract to erect and complete the Canada Permanent Building on Garry street, on the site of the old Manitoba Club building. It is estimated that the contract will amount to about $80,000. Work will commence at once.

Power Plants, Electricity and Telephones

Belle Plaine, Sask.

Tenders will be received by John Poyser until April 15th for the construction and supply of all material for the proposed telephone line of the Stoney Beach Rural Telephone Company.

Dunnville, Ont.

The ratepayers have defeated a bylaw to grant $5,000 as a bonus to the Dunnville, Wellandport and Beamsville Railway.

Grey, Sask.

Tenders were received by Elmer Auld, Grey, Sask., until April 3rd for the construction of 24 miles of telephone line, 30 poles to the mile, and 72 miles of wire for the Grey-Milestone Telephone Company.

Ingersoll, Ont.
The council will endeavor to acquire the plant of the Ingersoll Light and Power Company. They have been empowered to institute arbitration proceedings, if necessary, to fix the price.

Kamloops, B.C.
H. K. Dutcher, consulting engineer, reporting upon the power project, estimates the cost of changing to the three-phase system at $20,000. This includes the installation of a new intake pipe.

London, Ont.
City Engineer Sifton has recommended to the City Council the acceptance of the offer of the Hydro-Electric Power Commission to supply 5,000 electrical horsepower at $29.81 per horse power per year.

Mr. R. S. Kelsch, of Montreal, has been retained as electrical expert by the city in connection with the proposed power scheme.

Lethbridge, Alta.
The Alberta government has purchased a site in Lethbridge for a telephone exchange, which will be the long distance headquarters for Southern Alberta. For further information address W. H. Cushing, Calgary, Alta.

Melville, Sask.
The Council is considering plans for a local telephone system. For further information address Leon Benoit, secretary.

New Liskeard, Ont.
Mr. Cecil B. Smith, consulting engineer, of Toronto, has been engaged in connection with a project for developing water power on the Matabitchouan river.

New Hamburg, Ont.
The ratepayers have carried a bylaw to assist the People's Electric Railway to the extent of $20,000.

Nelson, B.C.
The Cranbrook Telephone Company, which bought out the Fernie telephone system from the Crow's Nest Pass Coal Company last November, has decided to construct a line from Fernie to Lethbridge, connecting there with the Alberta Government system. In addition to this extension is the project of the same company to construct a line to Port Hill, Wash., and so obtain connection with Spokane.

Owen Sound, Ont.
A petition is being circulated asking the Government to guarantee $150,000 bonds of the Georgian Bay Power Company, a local concern.

Peterborough, Ont.
The ratepayers have defeated a bylaw to issue debentures for $15,000 to develop municipal power in connection with the new dam.

Sombra, Ont.
The South Lambton Telephone Company are preparing to extend their lines to Thornyhurst and Bickford.

Tregarva, Sask.
The Tregarva Rural Telephone Company has been incorporated, with head office in this town.

Toronto, Ont.
The Toronto Railway Company have arranged to lay new tracks upon portions of College street, Avenue road, Yonge street, Gerrard street, Church street, and Queen street, and the City Engineer proposes to construct an entirely new foundation.

City Electrical Engineer Aitken has forwarded to Mr. Alexander Dow, the Detroit engineer, the specifications for the conduits and ducts necessary in the construction of that section of the municipal electric plant south of Queen street and from the Don to the Exhibition Grounds. Mr. Aitken states that 300,000 feet of ducts will be required for this section of the work.

The present negotiatings between the City Council and the Toronto Railway Company may result in the construction of fifteen miles of new track this season.

Wilcox, Sask.
Sealed tenders were received by A. E. Hadley until April 5th for all work and materials necessary for the construction of a telephone system for the Wilcox Rural Telephone Company.

Theodore, Sask.
The Springside Telephone Company will commence at once the work of building 80 miles of line. Switchboards will be installed at Theodore, Springside and Beaverdale.

Winnipeg, Man.
Smith, Kerry & Chace, engineers for the power scheme, have sent in an estimate that $782,544 will be the amount expended on the scheme during the fiscal year beginning May 1st next.

AWARDED.

Calgary, Alta.
The City Council has awarded the following contracts for material to be used in the construction of the Calgary Municipal Railway: 1,110 tons of steel rails, 400 tons of which will be 80-lb. and 710 tons, 60-lb., to Lorain Steel Company, represented by Gorman, Clancey & Grindley, Calgary, for $70,000; the contract for ties to the East Kootenay Lumber Company, at 56 cents each. The Standard Supply Company secured a contract for the steel poles required at $32.50 each for 28-foot poles.

Montreal, Que.
The contract for two miles of 3-conductor paper insulated lead covered cable, under a five-year guarantee, has been awarded by McGill University to the British Insulated & Helsby Cables Limited, Montreal.

The Northern Commercial Telegraph Company have awarded a contract to Michael Connolly, of Montreal, to build one thousand miles of telegraph and telephone line from Point Levis to Windsor, Ont., as well as several branches.

Vancouver, B.C.
The contract for the police signal patrol system has been awarded to the Gamewell Company, an American concern, at $12,647. The Northern Electric Company of Canada tendered at $12,200.

Miscellaneous

Atwood, Ont.
Tenders addressed to J. Lochhead, clerk, Township of Elma, will be received until April 10th for the construction of a drain in the Townships of Elma and Grey. Plans and specifications may be seen at the clerk's office at Atwood.

Hamilton, Ont.
The Dominion Power and Transmission Company have purchased a Koehring street paving mixer, which they are now using on construction work.

Montreal, Que.
It is expected that when Major Stephens president of the Harbor Commissioners, returns to Montreal next month, decisive steps will be taken towards constructing a dry dock for the St. Lawrence route.

Prince Rupert, B.C.
Alternative tenders (1) for wharf complete, inclusive of slips; (2) for wharf complete, exclusive of slips, will be received until April 27th by Edward Mohun, Assistant Engineer, Department of Public Works, Victoria, B.C., for the construction of a concrete wharf, with timber superstructure, at this place.

Stony Mountain, Man.
Tenders for $7,000 six per cent. twenty-year school debentures will be received until April 22nd by A. Saunders, Secretary-Treasurer.

St. John, N.B.
The City Council have finally accepted the plans for the development of the West Side harbor facilities, as submitted by Louis Coste, consulting engineer, of the Public Works Department. The plans provide for the construction of seven docks from Sand Point to Beacon Light.

St. Johns, Nfd.
Local agents of Lord Northcliffe have received a further sum of $625,000 for general investment purposes.

Truro, N.S.
Tenders addressed to Eugene Fiset, Minister, Department of Militia and Defence, Ottawa, will be received until April 15th for the construction of a rifle range at this place. Plans and specifications may be seen at the offices of the Director of Engineer Services, Militia Headquarters, Ottawa; the officer commanding the Maritime Provinces Command, Halifax, and Lieutenant J. C. Creelman, Truro, N.S.

Vonda, Sask.
The ratepayers will vote on April 7th on bylaws to issue debentures for the following: $5,000, 20-year 6 per cent. for the purpose of obtaining a supply of water for household and fire protection purposes; $1,500, 10 years, 6 per cent. for street improvements, and $5,000, 6 per cent. 20 years to build a town hall.

Winnipeg, Man.
Tenders will be received by Hugh Armstrong, Provincial Treasurer, until May 1, for the purchase of the following debentures, issued under authority of the statutes of the province, passed by the legislature of Manitoba this year: Province of Manitoba, $200,000; Western Judicial District, Province of Manitoba, $50,000; Northern Judicial District, Province of Manitoba, $12,000.

Tenders addressed to Hunt, Noble and Card, 611 McIntyre Block, solicitors for the Williamson Construction Company, will be received for the following subcontracts in connection with the erection of a transmission electric power system between Point du Bois and Winnipeg: Clearing, piling, ditches, bridges and culverts, complete footings and corduroy.

AWARDED.

Calgary, Alta.
The C. P. R. Irrigation Department have awarded to Foley, Welch & Stewart the contract for the excavation of over 600 miles of canals and ditches. Work will commence on April 15th.

Montreal, Que.
The contract for 22,250 bags of Portland cement to be used during 1909 in the improvements that are now being carried out in the port, has been awarded, by the Harbor Commissioners, to the Lakefield Portland Cement Company, of Longue Pointe.

ESTABLISHED 1886

Contract Record

In which is incorporated

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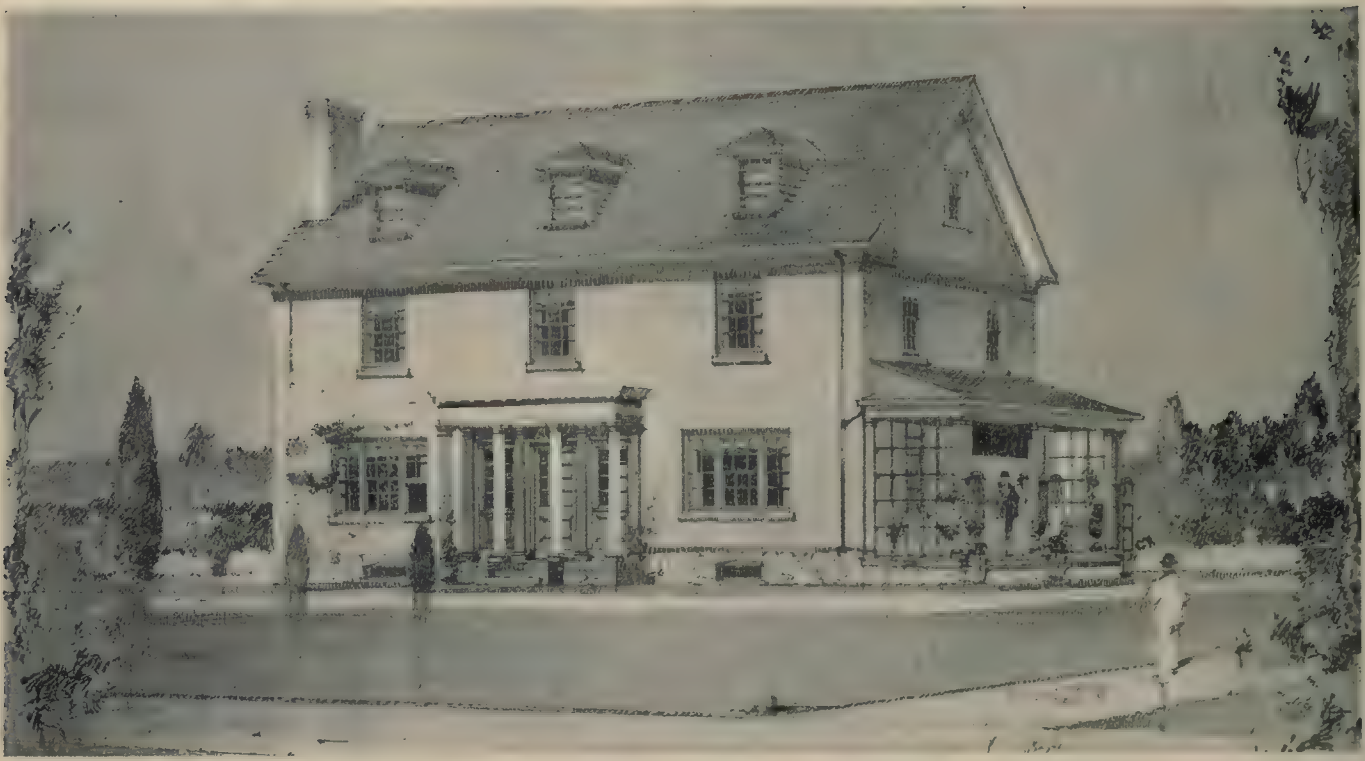
Association for Employer and Employee

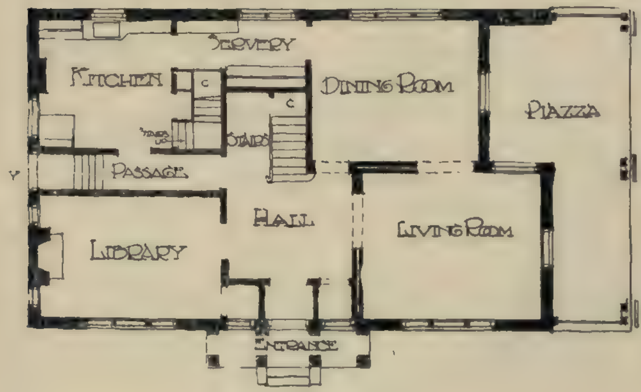
The formation of trade associations, for the advancement of the interests of those engaged in them, is a feature of the business life of to-day which is spreading to almost every line of trade imaginable, yet in the multiplicity of the associations which have been formed, one seldom hears of the formation of associations having for their object the lessening of the misunderstandings which so continually occur between mutually depending trades or professions. In the building business, for instance, we have had trades associations innumerable, such as plumbers' associations, plasterers' associations, bricklayers', masons' and carpenters' associations. In the building professions we have had architects' associations and engineers' associations, and we have had associations of contractors, and builders' exchanges, but we seldom hear of an association being formed for the bringing together of those who direct and those who perform labor. The object of associations in general is to promote the trade interests of those engaged in particular lines of work or business, and in the promotion of those interests, it frequently occurs that the interests of other bodies are seriously injured. Classes, such as architects and artisans, whose work is inter-dependent, are more often at cross purposes than at parallel ones. The result is a sacrifice of the interests of both parties, and of the public whom they serve. Trades unions have been so formed in the pursuit of their own peculiar interests that their name has come to possess a sinister meaning, a sort of "what we have we hold" idea, instead of the idea of improving the workmanship and ability of their members.

It would be an experiment worth working out carefully, to try the formation of an association of masters and workmen, which would take in the employer and the employee in the building industry. Such a movement has been commenced in Washington, D.C., and carries every indication of success. Its objects, as set forth in its conditions, are to bring the employer and the employee into closer and more friendly intercourse, to reform the abuses relating to the business, to secure freedom from unjust and unlawful exactions, to promote the interests of the members, and to encourage the highest standard of workmanship and the highest possible wage, merited by skill and proficiency. Other objects are to adopt ways and means of peacefully adjusting and settling all controversies, and to establish free, independent and "open shop" principles, as a permanent condition; to acknowledge the right of every man to be free and independent, and to deny the right of any individual organization or union to infringe the same. The movement has been taken up by members of every trade and is meeting with encouraging success. At the organization meeting over 150 men were present and about 100 became members. Since then many other members have joined. Among the officers elected were a master builder, a journeyman bricklayer, a journeyman carpenter and a master bricklayer.

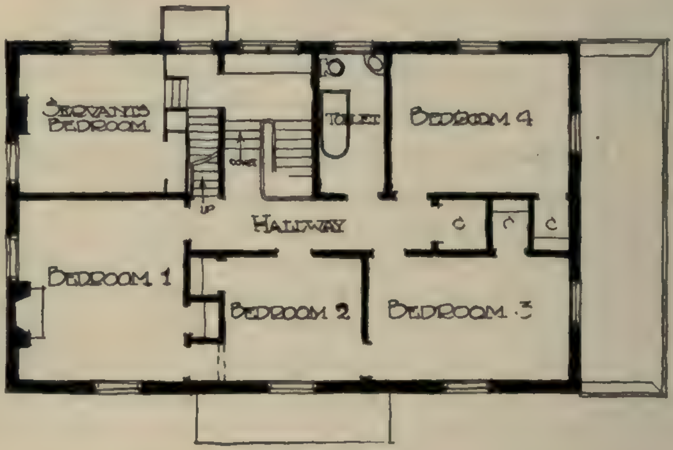
As an attempt to bring capital and labor together on an equal basis, in the industrial question, this movement should prove of much interest to everyone. It has been inaugurated in a conservative and careful manner. There will be many pitfalls in its course, but they will not be of the kind that cannot be avoided. It would be a good thing if a similar movement could be inaugurated in Canada. There is no question but that it would result in benefit to both capital and labor, and that it would also result in a higher class of workmanship, better business ideals, and a saving in cost of construction, which could be devoted alike to the interests of the employer, the employee and the public who have to foot the bill. The affirmation of the necessity for freedom, coming as it does partly from representatives of trades which in the past have done so much to promote the "union shop," is a strong reason for believing that this bone of contention will not prove so serious as one might expect. The "declaration of independence" inserted in the constitution is in the following terms: "We declare and affirm that absolutely personal independence of the individual to work or not to work, to employ, or not to employ, is a fundamental principle, which should not be questioned or assailed; that upon it depends the security of our whole social fabric and business prosperity, and that employer and employee should be equally interested in its defence and preservation. That the interests of the employer and workmen are so closely interwoven that they must work together in harmony for success, which can only be done by being free and independent of the dictations and coercing influence of trades-unionism or any third party."



Attractive Residence to be Erected at Milton, Ont.



Ground Floor Plan.



Upper Floor Plan.

House at Milton, Ont.

This house is shortly to be erected at the above place. The whole has been designed with due regard to simplicity and economy. The plan is regular with an inset on the piazza side of the ground floor, which has been bridged over on the bedroom plan, thus forming a true rectangle for the main roof. The living room, dining room and library all enter the hall, whilst a servery connects the kitchen with the dining room. Sliding doors connect living room with dining room and hall. French casement windows open from the dining room to the piazza, the inset on the plan of the latter being used in the summer time as a tea room. There is a clothes chute from the upper floor to the laundry in the basement.

The elevations are simple and regular. The exterior walls are veneered with bricks of a light red color, with wide white mortar joints, the basement being of rough stone. The entrance porch is of pine painted white. The floor is of hard brick and stone laid in pattern with wide joints. The ends of the piazza are latticed for vine growing effects. Sash windows are being used, the trim painted white.

The roofs and attic gables are covered with shingles finished in a silver gray color.

What Architecture Reveals

The architecture of a people has a direct relation to its life. As the shells of crustacea indicate, to some extent, the nature of the creature within, so does a man's house reveal much of what he is. The character and style of one's house is an essential part of that environment which has so much to do with his development. For that reason, if for not other, architecture should seek always to realize the qualities of naturalness, simplicity, beauty, and substantiality, whatever others might attain.

The architect too often is obliged to cut his garment according to his cloth, and the cloth is a narrow and shallow lot. Houses that are built close to a curb line cannot be comfortable no matter what their interiors may be. All privacy is destroyed and there is no chance to plant flowers or cultivate a strip of grass or a shade tree. To live and not exist, people, especially children, should see plants and flowers, learn to cultivate them, and to appreciate color. This cannot be done in a house which covers the lot upon which it is placed. The success of the architect is not alone in designing and planning, but in giving to his client a house that is livable as well, where natural beauties are not ignored, and air and space are conserved as carefully as the location of a bathroom or a guest chamber. To-day more than ever the people demand these things, and look to the architect to supply them, and the house that simply represents dollars is apt to be a failure both æsthetically and commercially. And it is the architect, especially in small communities, who designs a house to be lived in, that finds beauty in simplicity and in interesting surroundings as to exterior, and in planning has a broad and inviting doorway, a living room that is full of sunshine, where the open fireplace is big and the stairway a pleasure and not a pain, with comfortable furniture all of good solid and simple design, that becomes most sought for in a community when the building of a home is considered. The success of the plan book, and the snare as well, is because it pictures these things. The owner wants them, but cannot distinguish between the impossible and the practical. It is for the architect to study his client as a physician does his patient, and the better he knows his pursuits and the temperament of his family the better he can plan his house.—The Western Architect.

The Artistic Possibilities of Brick

The "Architectural Record" recently commented editorially upon the possibilities of brick construction. It calls attention to the value of brick as a structural material and as a fire-resistant, showing how it has been used in places where heavy and difficult construction is called for, and points to the excellent state of preservation of the brick buildings that passed through the Baltimore and San Francisco fires. It adds that it would be difficult, in fact, to name a better structural and protective building material which presents, at the same time, so many advantages to the decorative artist. It existed at the time of the Assyrian ascendency, and the use of artistic brick work can be traced all down the history of nations to our own time.

For years in this country brick biuldings were resorted to where the expense of stone and granite and marble barred the use of these materials; it was looked upon as of secondary nature. That time has gone. To-day brick is regarded as an indefinitely better material structurally than is any of those others, and its beauty and adaptability are rapidly becoming keenly appreciated by our architects. Instead of being a mere substitute, it is used to-day in preference to everything else. The manufacturers of brick have absorbed this artistic spirit and amply second architects' efforts. Brick are made in all kinds of shape and colors, and beautiful effects are obtained by the use of even the roughest products, that, a few years ago, were used only in foundations, rear walls and in such inconspicuous places. We have indeed reached a burnt clay period. Our ablest architects are not only designing their most beautiful decorative work in fine terra cotta, but are seeking, particularly in domestic architecture, to make all of the exterior of brick, using the different colors and working up the patterns into quaint and attractive designs; and the result is that all over the country we see beautiful buildings of brick that will equal the work executed in that material, and equal to anything that has been done by the English or the Flemish or the Assyrian architect, and far more dainty and pleasing and artistic than the nearby work that has been wrought, at infinitely greater expense, in granite and marble and stone.—National Contractor and Builder.

A Note Upon Architectural Drawings

It is surprising what a number of architectural drawings—especially perspectives—are spoiled for want of artistic treatment, by bad judgment in the management of light and shade, figures drawn badly and out of scale, impossible trees, and general accessories all wrong. Some architects, whose work is otherwise splendid, will put in absurd little figures, apparently with an idea to enhance the height of their buildings. And when the building is completed, one often notices a chance natural effect of light and shade, whereas, had the perspective been drawn by an artist familiar with these effects, a fine result would have been obtained as well as a drawing worth keeping as a work of art.

Special "features" of a building often require prominence, and this can only be done by keeping the surroundings quiet; but only an artist will understand how to do this. One has only to see the exhibition of architectural drawings at the Academy any year to see how insipid and wanting in artistic treatment most of the perspectives appear. The general average is "stodgy," with what is known as the "Academy treatment." There are a few architects who treat drawings very finely, but they are the rare exceptions. It seems a pity that many excellent designs are spoiled or fail to have justice done to them for want of artistic management. Architects generally suppose that an artist would spoil their details, but this is not so where proper judgment is considered and an artist of proved ability given the work to do.—London Studio.

Concerning Bungalows

Correctly speaking, the word "bungalow' 'describes a one-storey thatched or tiled house, with wide verandahs on at least three sides. The word is of Anglo-Indian origin, and was first used to describe this type of building, so well known in India. The dak-bungalow is a house for travellers, such as are constructed by the India Government at intervals of twelve to fifteen miles on the highroads in many parts of India.

The adaptability of the bungalow form of dwelling to the requirements of families of moderate size has been realized by architects for many years, and the results achieved, particularly on the Pacific coast, where climatic conditions favor this type of house, have been satisfactory in a high degree.

Where a second storey has been added the building loses its chief characteristics and cannot be truthfully designated as a bungalow. It becomes simply a cottage on bungalow lines.

In the family of moderate size and income the convenience of arrangement found in the city "flat" and the country bungalow are particularly attractive. It reduces the care of the house to a minimum and offers convenience of arrangement not afforded in houses of more than one storey.

Cement users should keep continual tests of the fineness of the finished cement. Fine cement is wanted nowadays.

Personal Mention

Mr. S. B. Clement, A.M., Can.Soc.C.E., has been appointed chief engineer of the T.N.O. Railway.

Mr. J. W. Blackman has been appointed City Engineer of New Westminster at a salary of $2,000.

Mr. E. N. Harvey has been appointed Municipal Engineer of South Vancouver at a salary of $125 a month.

Mr. A. F. McArthur, city engineer of Guelph, has been appointed town engineer for Yorkton at a salary of $2,000 per annum.

Mr. George T. Clark, of Toronto, has been appointed City Engineer of Saskatoon, Sask. There were seventy-five applicants for the post.

Mr. J. R. Heddle, formerly assistant engineer at Hamilton, Ont., has been appointed City Engineer of Brandon, Man., at a salary of $2,000.

Mr. Owen W. Smith, of Galt & Smith, consulting engineers, 23 Jordan street, Toronto, leaves this week for Calgary and other western points.

G. W. Robinson, secretary-treasurer, Lethbridge, Alta., invites applications for the position of Building Inspector. Salary, $1,500 per annum.

Mr. Thomas H. McCauley, superintendent of the Port Arthur franchises, has been appointed manager of the new electric street railway in Calgary.

Mr. Charles F. Medbury has been appointed manager of the Montreal office of the Canadian Westinghouse Company, as successor to Mr. H. D. Bayne.

Messrs. S. Gagne and Gordon T. Jennings have opened an office as consulting engineers in the Lawlor Building, corner Yonge and King streets, Toronto.

Mr. J. F. B. Vandeleur, Canadian agent for several noted English manufacturers of electrical apparatus, recently returned to Toronto from a three months' business trip to the Old Country.

Mr. C. W. Stokes, formerly manager of the Kenora Electric and Telephone System, is now associated with the Northern Electric and Manufacturing Company, taking charge of the electrical apparatus for the Toronto district.

Third Annual Convention of National Association

The third annual convention of the Canadian National Association of Builders was held in Ottawa last month. In the previous issue of the "Contract Record" will be found an account of the requests made before the Minister of Labour by a deputation from the association. Owing to pressure of space, the publication of further news of the convention was unavoidably held over to date.

The following delegates were present:

Ottawa—Messrs. Smith, Lackie, Ackroyd, McFarlane and D. J. McKenzie, secretary, in addition to Mr. Geo. A. Crain, vice-president; Mr. J. T. Blyth, representative director. London—Mr. Geo. Everitt, in addition to Mr. Wm. Tytler, provincial vice-president for Ontario; Mr John Whittaker, representative director. Quebec—Messrs. P. A. Lamonde, A. G. Auger and J. E. Bedard, in addition to Mr. E. T. Nesbitt, representative director. Montreal—Messrs. E. T. Houghton, N. Simoneau, J. P. Anglin, B. H. Wills, Chr. Sonne, John Quinlan, E. W. Sayer, and N. T. Gagnon.

Mr. George S. Gould, the secretary of the London Exchange, was absent through illness, and the members passed a resolution of sympathy.

Many propositions of internal interest were discussed and not a few which affected the trade at large.

The secretary submitted that it would be wise to define the attitude recommended by this federated association towards the labor question, and while not moving any formal resolution he reported that the following general principles had been adopted by the Montreal Exchange as the preamble to its newly revised by-laws:

1. This association affirms that absolute personal independence of the individual to work or not to work, to employ or not to employ, is a fundamental principle which should never be questioned or assailed, that upon it depends the security of our whole social fabric and business prosperity, and that employers and workmen should be equally interested in its defence and preservation. While upholding this principle as an essential safeguard for all concerned, this association would appeal to employers in the building trades to recognize that there are many opportunities for good in associations of workmen, and while condemning and opposing improper action upon their part, they should aid and assist them in all just and honorable purposes; and that while upon fundamental principles it would be useless to arbitrate, there are still many points upon which conferences and arbitration are perfectly right and proper, and that upon such points it is a manifest duty to take advantage of the opportunities afforded by associations to confer together, to the end that strikes, lockouts and other disturbances may be prevented. When such conferences are entered into care should be taken to state clearly in advance that this fundamental principle must be maintained, and that such conferences should only be competent to report results in the form of resolutions and recommendations to the individuals composing the various organizations participating, avoiding all forms of dictatorial authority.

2. That there shall be no limitation as to the amount of work a man shall perform during his working day.

3. That there shall be no restriction of the use of any manufactured material, except prison-made.

4. That there shall be no restriction of the use of machinery and tools.

5. That no person shall have the right to interfere with the workmen during working hours.

6. That the foreman shall be the agent of the employer.

7. That the members of all local exchanges be urged to give more attention to the matter of securing apprentices to the various trades represented in our organizations, to the end that the supply of skilled workmen in any craft may not be diminished.

It was moved by Mr. Tytler (London), seconded by Mr. Nesbitt (Quebec), and resolved, "That this convention heartily approves of the work already done by the Canadian National Association of Builders, and hereby pledges its moral and financial support in the future building up of associations of employers in the building trade."

Mr. Blyth (Ottawa), spoke strongly on the urgent need of getting all builders to adopt a uniform contract subject only to minor variations required by different provincial laws, and to ask all other Builders' Exchanges throughout the country to get interested in the matter.

In another column will be found a paper, entitled "The Liability of Employers," read before the convention by Mr. William Tytler, executive officer for London, Ont.

The election of officers resulted as follows:

President, Geo. A. Crain, president Ottawa Exchange; Vice-president, Wm. Tytler, director London Exchange; Provincial Vice-presidents: Ontario, John Whittaker, president London Exchange; Quebec, E. T. Nesbitt, vice-president Quebec Exchange; Manitoba, W. H. Carter, president Winnipeg Exchange; Representative Directors (from each corporate exchange): Messrs. T. D. McFarlane, Ottawa, Ont.; Geo. S. Gould, London, Ont.; W. E. Ramsay, Montreal, Que.; P. A. Lamonde, Quebec, Que.; J. W. Morley, Winnipeg, Man.; General Secretary-Treasurer, J. H. Lauer, secretary-treasurer Montreal Exchange.

The next convention will be held next February at either London or Toronto.

Employers' Liability

At the recent Ottawa convention of the Canadian National Association of Builders, Mr. William Tytler, executive officer for London, Ont., read an interesting paper, entitled "The Liability of Employers." Mr. Tytler said in part:

The great fault with all legislation bearing on this subject is that the framers of it appear to think that it is only the workman who has rights, and hence that it is he alone who needs protection. Now, I do not say that the law should not afford protection to men engaged in hazardous occupations; on the contrary, I consider it but right, and I believe every gentleman present will agree with me, that when a workman sustains injuries while in the service of his employer, he or his family should receive reasonable compensation, particularly when the negligence of the employer is partly or wholly responsible for such injuries. What I do contend, however, is that in all laws relating to this subject consideration should be had for the rights of both sides; in other words, that there should be a square deal all around. What is of equal importance, the machinery for carrying out these laws should be such that there would be no danger of either party to a controversy suffering injustice.

Every province of the Dominion now has its Employers' Liability Law, legislation along that line being among the first measures passed by the Legislatures of Alberta and Saskatchewan; but in every instance either the law is defective or the means of enforcing it are unsatisfactory. So manifest is this that liability insurance companies have fixed their rates as applied to building contractors at figures that are exorbitant, so that premiums have become an annual charge of a serious nature. Were the liability laws made equitable there can be no doubt that these premiums would be reduced to a minimum.

The Ontario law is particularly unjust. It fixes a maximum compensation of $1,500 for injuries to a workman, but if negligence on the part of the employer is shown heavier damages may be awarded. Experience shows that ,as a rule, juries will allow the limit of compensation even if contributary negligence on the part of the injured is proven. The fact is that in the great majority of cases juries are actuated solely by sympathy, and rarely give judgment or assess damages according to right and justice.

Then, too, instances are not unknown where lazy workmen have wilfully permitted themselves to be injured in order that they may secure weekly wages without working, or, where the indications are that the workman will soon be laid off, advantage has been taken of this most nefarious means of ensuring for himself an income where there is work for him to do. Even when the employer is convinced and has proof that there has been foul play on the part of a claimant, he will settle with the imposter rather than have the case go to trial before a tribunal from which he cannot hope to obtain justice, so that the fraudulent one is certain of ill-gotten gain.

What makes matters worse, even when there is a just claim for compensation, the employer finds it practically impossible to effect a settlement. Any honest employer will admit that when an accident happens wholly or partly as a result of negligence on his or his foreman's part, reasonable compensation is due the victim, and in such cases is quite ready to arrange a reasonable settlement. But when the employer visits the home of the injured man he finds that some hungry lawyer has been there before him and has succeeded in inducing the suffering one or his family to on no account agree to any settlement. The lawyer is particularly familiar with the statute bearing on such cases; has, indeed, made it a special study and perhaps knows from experience how easy it is to work upon the sympathies of the average jury and induce it to plan damages at the top notch. The result is the case goes to court, the plaintiff gets what the lawyer promised him, while the lawyer himself finds his pocket book fattened at the expense of the hopeles defendant.

Meanwhile employers do all in their power to lessen the danger of accidents, realizing that as a measure of self-protection it is the part of wisdom to do so, but in spite of all they do, accidents happen and in the end the employer gets the worst of it.

I cannot but feel that until there has been a change in the law in the right direction, employers of labor, particularly those engaged in the building trades, will be constantly at the mercy of unprincipled lawyers and their clients, as well as of juries which, it would seem, are incapable of deciding such cases on their merits.

I repeat, gentlemen, that all we ask for is what we are entitled to—a square deal—instead of a law that is one-sided in its operation and unjust to an important section of the public.

What, in my opinion, is needed is a Dominion law that would work uniformly all over the country. Such a law might include a provision removing all such cases from jury trial. Indeed I would go so far as to advocate this removal from the law courts and provide machinery for the carrying out of the law by the Department of Labor. That body, as is well known, has been eminently successful in bringing about the settlement of disputes of other kinds between employers and their employees. Why should it not be able to secure a just adjustment of claims such as those under discussion? I will go so far as to say that arbitration boards appointed by the Department of Labor, or chosen one each by the parties concerned and a third by these two or by the department, but all under the authority of the department, would be the means of easily and justly settling all such claims for compensation.

"Whatever is worth doing is worth doing well." This is an old saying, but it is as pregnant with truth to-day as when first said. While it is well and proper to do all you can, it is better to do well what you do, even though it be little, than to do much in a careless, slovenly manner. "Show by your good works" that you are a good mechanic, an honest man and fit to be trusted, and you will receive your reward in this world and stand a good show of getting recompense in a better one after you have finished your work in this.

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Heating and Ventilating Methods

In the onward march of improvement in the science of steam and hot water heating, an effort is constantly being made to cheapen the cost of installation of the apparatus, and this desire is carried to such an extent that frequently cheap methods are in vogue which have been erroneously called improvements, but which have nothing more than their cheapness to recommend them.

It is our desire in this article to call attention to some of the older methods which might at this more advanced time be followed to good advantage, in so far as efficiency is concerned, and yet which, when expense is considered, add somewhat to the cost of the work. We realize that improved methods of manufacture, the use of specially designed machinery, together with a decreased expense for raw material, have reduced the cost of the material entering into the construction of heating apparatus. This is a legitimate reduction, without necessitating in any way the sacrificing of efficiency, and it has, therefore, no part in this discussion.

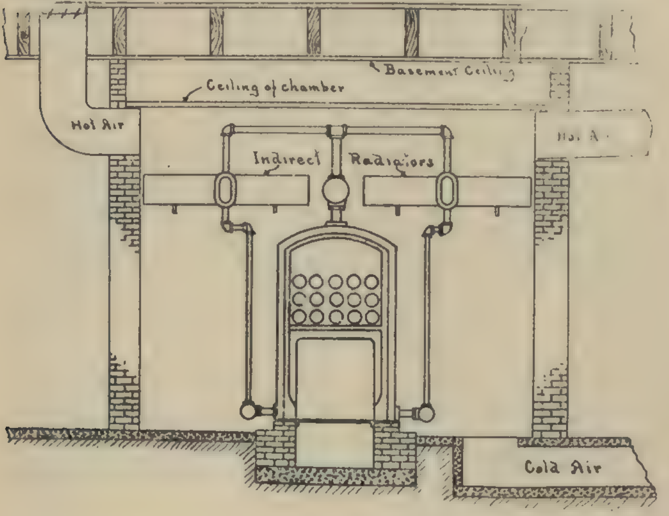


Fig. 1

We have many times had occasion to remark that, as a people, we seemed satisfied to breathe impure air, and suffer from the ailments produced by such laxity, provided the temperature of our homes was retained at a comfortable degree of warmth. It is doubtless due to this fact that the manufacturers of steam and hot water heating apparatus have ceased to advocate the adoption of methods which are more costly and yet vastly superior to those to-day in use. Unless some decided stand is taken by the manufacturers and decidedly more attention paid to the health, as well as to the economical conditions of the people, we prophesy that the furnace manufacturers, who are cognisant of these conditions, will successfully endeavor to stifle the increasing demand for steam and hot water heat. Notwithstanding all arguments to the contrary, a furnace is, when properly installed, more healthful than a steam or hot water heating system, as it is in a majority of cases to-day installed, the furnace supplying, as it does, an abundance of fresh air as well as plenty of warmth.

One of the many excellent old-time methods is illustrated by fig. I. The heater (steam or hot water) was placed in a special bricked-in compartment in the basement of the building, the front of heater being set flush with an outside wall of this room for convenience in firing and attending, and in order that the enclosure would be entirely separated from the remaining portion of the basement. The heater was left uncovered in order to allow it to radiate heat from its outside surfaces.

Stacks of indirect rediation were connected directly above the heater. Cold and fresh air was supplied from a duct entering at the bottom of the enclosure, and from points near to the top warm air pipes were taken out and connected to registers in the main living room and hall, thus not only providing for the heating of these rooms, but supplying at all times a quantity of pure, fresh air.

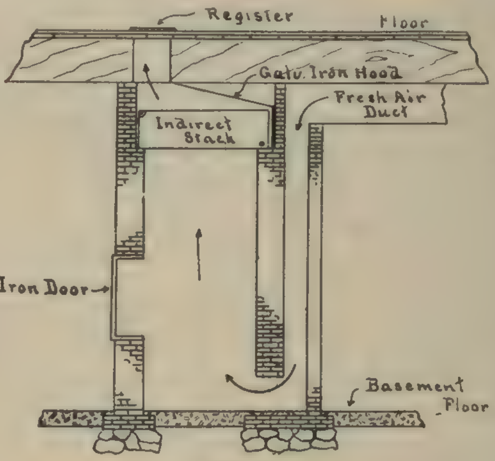


Fig. 2

For heating isolated rooms, far removed from the heater, or those having more than an ordinary amount of exposure, direct radiators or heating coils were used, and these were supplied by pipes from the heater.

The efficiency of this type of heating apparatus has never been questioned. The additional cost, in comparison with a direct system, has, we believe, alone been responsible for the discontinuance of its installation.

In supplying cold air to indirect radiators, the old method, as shown by fig.2, is commendable. The stack of indirect radiation is supported by the walls of a small brick chamber, and the cold air, carried across the ceiling or floor of the basement, enters at the bottom of this chamber. The velocity of the entering air is thus lessened, and the supply filters slowly through the radiator, which thereby extracts more of the heat units than it is possible to secure by the later methods of to-day. Here again is efficiency sacrificed for first cost of installation, as by the later methods of installing indirect radiation the radiator is now usually cased in iron or wood and the air supplied direct to the radiator.

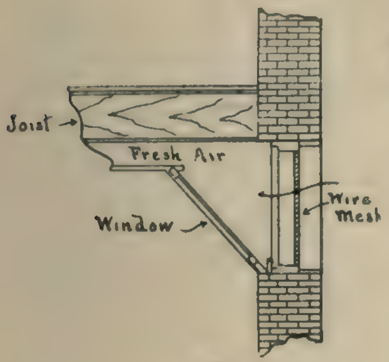


Fig. 3.

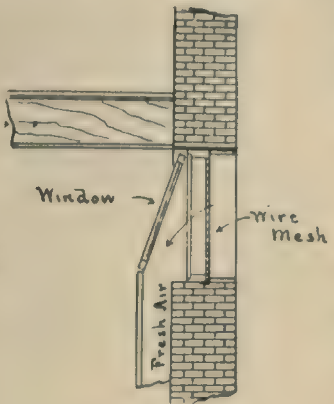


Fig. 4.

Figures 3 and 4 show methods of admitting air from an outside window—one of the early methods which had much to commend it. Taking air from the basement is ordinarily poor practice, and yet, at times, this course is not only practical, but strongly advisable. The methods illustrated by figs. 3 and 4 show a hinged inside or supplementary window, which, when opened, mixes the air from the basement with the air from the outside as it enters the cold-air duct. The illustrations show two methods—one taking the cold air across the ceiling of the basement, and the other taking the cold air down to a duct under and across the floor of the basement.

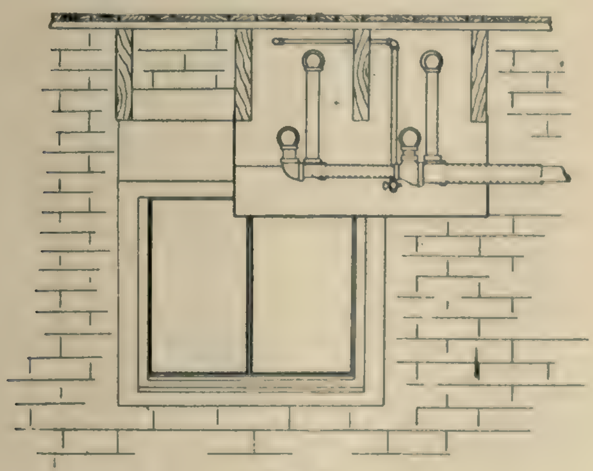


Fig. 6.

It is a well known fact among heating men that wrought iron coils are more efficient than cast iron radiation, and yet the inconvenience of placing a large amount of heating surface within a limited space often precludes the use of coils. An old method of using wrought iron pipe for indirect coils is shown by fig. 5, and by the application of this idea a large amount of heating surface is placed within a comparatively small space. One of the advantages gained by this method is that the air to be warmed has a longer travel through the coil than is the case when the later forms of cast iron indirect radiators are used. The difference is brought about by the provision of a series of baffle-plates, or diaphragms, used in the manner shown by sketch and designated A, B, C, on the drawing.

An end view of this type of coil is shown by fig. 6, which shows clearly the connection of both flow and return pipes and the manner of venting the coil or freeing it of air. No valves are shown, as when installed according to the earlier methods it was customary to have all indirect heaters in service as long as there was any heat in the apparatus,

When operating under the old methods the cost of installation, as we now consider cost, seemed excessive, but we should bear in mind that a large portion of this cost, and also of the increased consumption of fuel, was directly chargeable to the provision of ventilation or the pure air supply—an item well worth its expense.

Supposing that we should to-day install such a type of heating apparatus and apply it to the benefits of a vacuum, vapor or accelerated system of hot water heating, we would reap all of the good results obtained by this older method at a decreased cost of installation and of maintenance, thus producing a truly ideal system of heating and ventilation for a residence or small building.

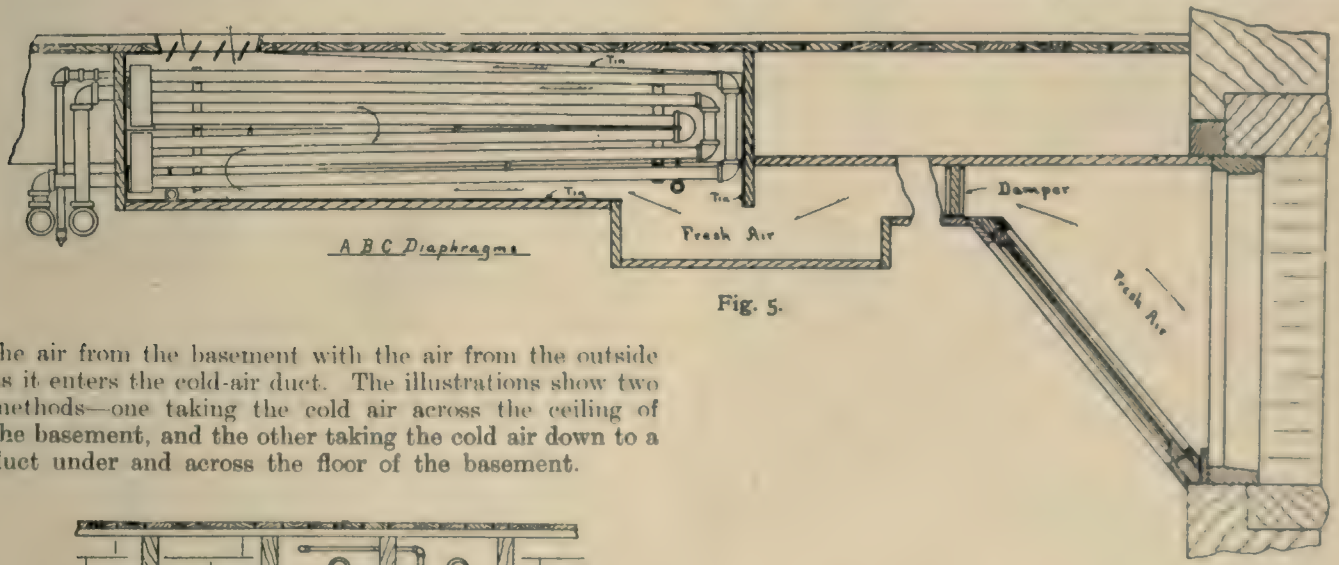


Fig. 5.

At this time, when the style of heating described in this article was in general use, it is probable that the cost of materials was about double what it is to-day for the same materials, and therefore, notwithstanding the fact that the cost of labor is somewhat higher than at that period, evidently the total expense of installation should not exceed by very much more than one-half of the former amount. With decreased cost of manufacture has come increased efficiency, and there should be a saving effected of nearly one-third in fuel or the cost of maintenance.

Therefore, all things considered, it is well worth while to give some thought and attention to the older methods and not discard them until we are fully satisfied that modern methods offer a real improvement.—A. G. King, in the "Architects' and Builders' Magazine."

Recent Legal Decisions

Supply of Unsatisfactory Material.—The Pacific Coast Pipe Company recently brought action against the city of Fort William, before Falconbridge, C.J., for the balance alleged to be due for wooden piping furnished for constructing a system of water works within the municipality. Chief Justice Falconbridge, in his statement, said that he found the pipes were purchased by the defendants, relying upon statements and warranties contained in the plaintiffs' catalogue and in the correspondence, in fact that the pipe would give satisfaction and would fill all requirements perfectly. He had not found that there was any repudiation by the plaintiffs of this suggestion, and that the defendants relied upon the plaintiffs' skill and judgment to supply pipes fit for the purpose required, and that the pipes were purchased by the defendants relying upon the statements and warranties of the plaintiffs. He found also that the pipes had not filled such requirements and that this was not due to any negligence on the part of the defendants in the laying of the pipes, which was done largely under the supervision of the expert supplied by the plaintiffs. He gave judgment therefore for the defendants upon the counterclaim, with a reference to the Master to ascertain the damages.

Action for Balance of Contract Price.—In the case of Winger v. the village of Streetsville, which recently came before Judge Britton, suit was brought to obtain the balance of the contract price of work done by the plaintiff, and a counter claim was put in for damages for delay, defective work, etc. The contract was for the completion of concrete work of a dam and power house at Streetsville. The work was to be performed according to plans and specifications prepared by John S. Fielding and under his direction and personal supervision, or of a representative or clerk of works appointed for the purpose. The contract was entered into on March 27th, 1907, and the work was to be completed before October 15th, 1907. The plaintiff was to be paid upon the basis of work done, upon estimate and certificate in writing to be given by the engineer. On the third of September the plaintiff asked for the plans of the power house, as the work had reached the stage at which they were necessary. Plans were not furnished until the 26th of September, when a small white plan was furnished, and complete plans and specifications were not furnished until the 3rd of October. It was then too late for the plaintiff, working reasonably, with the means at his disposal to complete his contract before October 15th. On October 21st an arrangement was made by which the plaintiff was to devote all his effort to the concrete work, which he did under difficulties owing to the frost which was at hand. On November 15th the plaintiff considered that he was entitled to some money for the work performed, but Mr. Fielding would not give him a certificate. Mr. Fielding asked the plaintiff for a statement of his affairs, which the latter refused, but offered a certificate such as the contract provided for. This apparently would not satisfy Mr. Fielding. The plaintiff continued on the work more or less until November 22nd, when a conversation took place which was misunderstood by the parties to it. Mr. Fielding said that he asked the plaintiff to give up the work, and that the latter consented to do so without the five days' notice required by the contract. The plaintiff denied that he was willing to give up or to waive the five days' notice. Mr. Fielding then dismissed the plaintiff and prevented him from going on any further with the work.

Judge Britton found that the plaintiff was not liable to the defendants for non-completion of the work within the time specified, and that he was entitled to be paid for the work actually done by him, of which the defendants had received the benefit. He found also that the work had been fairly well done. He did not find that the plaintiff was entitled to any damages by reason of the delay in furnishing the plans. No time was kept of the men delayed while waiting and there was other work to do. The plaintiff was absent from the work and about his other business a great deal and possibly there was some gain in that. If he had anything to claim he should have been more careful to keep an account of his loss. The plaintiff's alleged loss of profits had very properly not been pressed. Judge Britton found in favor of the plaintiff for the sum of $1,440.12

Trade Opportunities

United States Consul George W. Shotts, of Sault Ste. Marie, in reply to an inquiry in reference to placing hand sweepers and road graders in that district, reports to his Government that there would be no demand for street sweepers, but there is a large amount of waggon road building being done, and there should be a demand for graders. The provincial government has decided to build by contract a trunk-line waggon road from Sudbury to Sault Ste. Marie, Ont., a distance of nearly 200 miles. Some work, such as surveying and cutting out of right of way, has been done, and active grading will begin in the spring and continue for two or more years. Besides this, the various townships are doing considerable road building, and a good grader that is not too expensive should find a sale in this district. The tariff on road graders would be 30 per cent. if horse-power and 35 per cent. if operated by steam. This duty is heavy and would be the only difficulty in placing machines.

United States Consul-General David F. Wilber, of Halifax, answering an inquiry in regard to the market for street sweepers and road graders in that district, reports that there is a good market for these articles, and one of the officials of the Board of Public Works in Halifax stated that they were in the market for such. At present the streets are swept with the ordinary brush broom, men being distributed over the city with certain districts to keep clean. The Provincial Government of Nova Scotia has recently appropriated $175,000 for the improvement of roads. This work will be carried on by the Commissioner of Roads, whose office is in Halifax, in conjunction with the municipalities of the province. The commissioner, as well as the Board of Public Works of Halifax, might care to investigate machines of this character.

Negotiations which are under way have reached an advanced stage, for the establishing of a line of steamers from Canadian points, in connection with the Tehuantepec National Railway, which runs from Puerto on the Gulf of Mexico, to Salina Cruz on the Pacific coast. The negotiations are with the Elder Dempster Line, for a service from Montreal in summer and St. John in winter, and with the Canada Mexico Pacific Coast Line for a service between Salina Cruz and Vancouver and Victoria. It is hoped to provide monthly sailings with a through bill of lading, a guarantee against loss in transshipment, and rates from 30 to 40 per cent. lower than all rail.

Prevention of Dampness in Cellars

Dampness is the chief enemy of mankind. Where there is dampness there is decay, where there is decay there is disease, where there is disease there is death. Eliminate dampness, says G. W. Kirwin in "Waterproofing," and fully one-half of the ills that flesh is heir to disappear. Those who have or are told that they have the germs of disease go to sections of the country where there is little or no rain and water is at a premium, while low lying, ill-drained, swampy regions are the abodes of fever, ague, rheumatism and consumption.

Foul odors in houses that have been kept closed for a time are invariably due to dampness. The odor is not dampness, but the evidence of dampness, and the most common place for a dampness to accumulate is in cellars and basements. To be damp, it does not follow that water must collect in sufficient quantity to form pools and small streams in those parts of the building constructed below the surface of the ground. Moisture is continually coming through and the warmth of the rooms above creates a draft that draws the cellar air—impregnated with odors—up into the house, producing that damp, unaired smell that is not only very unpleasant, but injurious to the health of the occupants of the building.

One often hears that "good drainage" is the one thing needful, but while good natural and artificial drainage are by no means to be despised—indeed, they are essential to the welfare of human beings—they do not counteract the natural tendency of moisture that is in the ground, even in what is called "dry" ground, to find its way into openings whether they be cellars, basements, caves, mines or mausoleums.

Much thought and careful study and experimentation have been given to the subject of excluding dampness, from the antediluvian time when the patriarch Noah pitched the ark within and without, to the present day, and many methods have been placed on the market. Some of them have merit, while others do not stand investigation, either theoretically or practically. Some give good results when under ideal conditions, but fail when placed in the hands of men not having special skill and expert knowledge.

Acting on the principle that an ounce of prevention is worth a pound of cure, the time to damp-proof a building is while it is being erected. There is nothing difficult or complicated about using a good material to exclude moisture from buildings. It is contrary to reason to apply any kind of preparation to the inside of a cellar wall and expect the house to be dry. The moisture will still be in the walls and if the damp-proofing preparation is able to keep it from coming through vertically it will travel horizontally, rising directly into the first floor, so that the last state of the house will be worse than the first.

The preparation should be applied on the footings as soon as they have been completed and the walls built on top of it; this prevents moisture rising by capillary attraction. After the walls are built and have become dry the preparation should be applied on the outside surface and carried well above the grade level, special attention being paid to having a good bond between that which has been applied over the footings and on the walls. Then the space between the walls and excavation should be filled in with earth, care and precautions being taken not to injure the damp-proofing material. On the cellar floors the damp-proofing should be applied between two layers of concrete, the same care being taken to unite the floor damp course with that over the footings, as with that on the outside walls. It is, of course, important to see that the concrete immediately on top of the damp course of the floor does not puncture the latter; if there are holes in the waterproofing it is certain that moisture will find its way through. Therefore, a safety coat of cement mortar should always be used on top of the damp course, and the concrete upon which the waterproofing is placed should be tamped down as smooth as possible.

If the damp-proofing be carried out in the above manner, it will be seen that the basement has been converted into a waterproof pan, and an absolutely dry cellar will be obtained. This scheme will be found of great practical value for builders and house owners generally, especially in the suburban and rural districts, where houses are often so located as to have damp cellars.

News and Notes

The commercial travellers' tax in Prince Edward Island has been abolished.

A jury recently returned a verdict awarding J. Hyndman $5,000 damages for loss of his right arm in the machinery in Stephens' brick yards at Fort William.

The Workman's Compensation Act which was recently introduced in the Legislature of Manitoba has been held over for another year. A number of modifications are proposed which will make it acceptable to manufacturers.

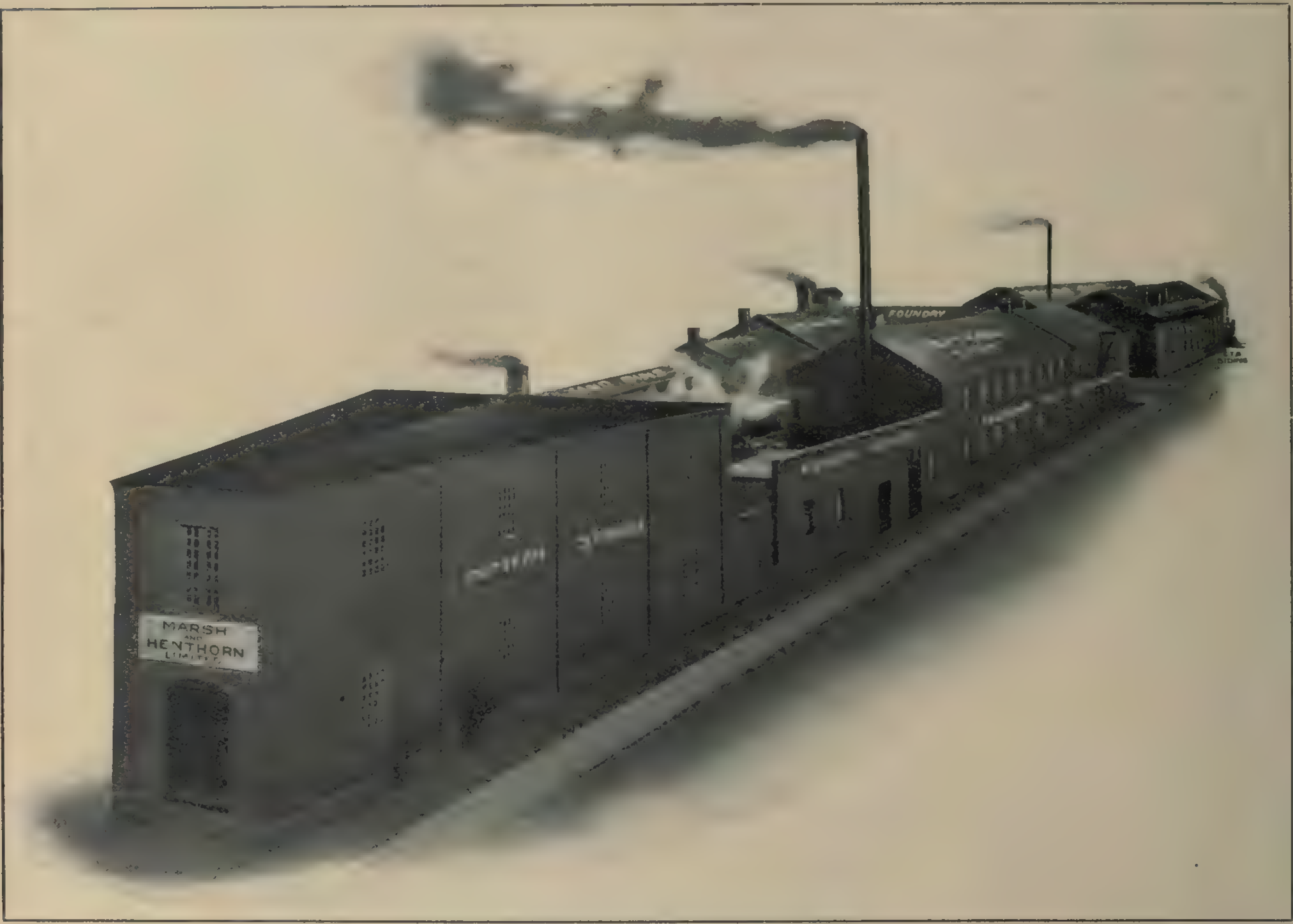
The Ontario Legislature will consider during the present session a proposal to reduce the business tax from 60 per cent. to 50 per cent. and to do away with the double system of taxation of officers of corporations who are also shareholders.

The librarian of the Toronto Public Library has offered to place at the disposal of manufacturers an entire section in the new reference library on College street for the catalogues of Canadian firms, and in cases where the catalogues are not properly bound to bear the expense of having them bound.

An amendment to the Stationary Engineers' Act, states that no one shall be eligible to take the examination for a stationary engineer unless he is a British subject and has resided in Canada for at least three years. Canadian manufacturers fear that this might cause serious trouble in times of labor difficulties and it is possible that the asociation will bring its influence to bear in opposition to the bill.

The new insurance bill introduced at Ottawa by the Minister of Finance contains a clause which prevents the agent of any insurance company not licensed in Canada from inspecting any risk or adjusting any loss on insurance carried by that company in Canada. This clause would tend to prevent companies like the New England Mutual Companies from carrying insurance in Canada. Opposition to the bill will be made by the Canadian Manufacturers' Association.

A movement is on foot among Canadian manufacturers, looking to the securing of reciprocal arrangements between Great Britain and Canada in regard to the patent law. It is thought, however, that some Canadian manufacturers may not be prepared to allow patents registered in Great Britain the privileges afforded by the Canadian patent regulations and the matter is at present hanging fire, pending the receipt of further information on the subject.



The Marsh & Henthorn Plant at Belleville, Ont.

A Progressive Belleville Concern

In the present age, if a firm wishes to establish upon a good basis a reputation worthy of the name, there are two things which it must continually bear in mind. These are a square, close deal—the maximum value at the minimum cost—and progressiveness. A firm which is living up to these principles is Marsh & Henthorn, Limited, manufacturers of hoisting machinery and contractors' supplies, Belleville, Ont. This business was established in 1846, and has been running continuously ever since, although the management has changed several times during this period of 63 years.

During its long career this plant has manufactured a great variety of goods. At one time the owners did a thriving business in farming implements, and many of their plows, mowers, etc., are still in use in Hastings and Prince Edward Counties. They also went extensively into the manufacture of stoves, their old Commonwealth stove being considered at one time the best wood stove for kitchen purposes in the Canadian market. Many of these old stoves are still in existence, although some of them are 20 or 30 years old, and they are still giving their owners good service. In this plant, some years ago, the Babcock & Wilcox water tube boilers were manufactured for the whole of Canada.

The present management took over the business 12 years ago and gradually dropped out of the implement and stove manufacturing business. They also discontinued the manufacture of the Babcock & Wilcox boilers, considering that this class of work was too heavy for the capacity of the plant. The new proprietors, after looking over the field thoroughly, decided to make a specialty of hoisting machinery and all contractors' supplies. To these goods they have directed all their energies and have succeeded in building up a trade which, in this line, is probably the equal of any in Canada. The Marsh & Henthorn hoisting engines are now in use throughout the whole Dominion of Canada. Almost every mining camp has one or more hoists manufactured by this concern and a great many of the railroad contractors of Canada favor this make of hoist. The firm are continually improving their product. Their idea is not only to keep it abreast with the times, but to make it, if possible, a little ahead of the times.

The plant in which the Marsh & Henthorn hoisting machinery is manufactured is an old one and not designed according to modern ideas, but has been built and added to from time to time as occasion required during the past 63 years. The tools, however, are modern and are specially adapted for the turning out of hoisting machinery. The boiler shop is furnished with the latest compressed air tools, has large plate rolls capable of rolling any size plate up to 12 feet in width, and has also two large punch and shear machines, one of which was especially imported from Glasgow, while the other machine was made on the premises. Cranes are provided at convenient points throughout the shop for handling heavy materials. The largest boiler which has yet been turned out by this shop was the boiler for the well known steamship "Alexandria," plying between

Charlotte and Quebec City. This boiler at the time of its manufacture, nine years ago, was the largest marine boiler which had ever been built in Canada up to that date, and Messrs. Marsh & Henthorn are justly proud of their success in turning out this class of work.

The blacksmith shop is equipped with a good steam hammer, which was also made on the premises, and which is capable of turning out forgings of any weight required in the hoisting engine business. The machine shop is equipped with several modern lathes, planers, shapers, drill presses, etc., including one large radial drill. In this shop, besides turning out the large variety of hoisting engines the firm also does a lot of repair work. The pattern shop equipment is almost all new and of the latest design, and includes two lathes, three circular saws, one band saw, two planers, etc.

Besides their extensive engine and boiler business Marsh & Henthorn have also gone largely into general steel plate work of all descriptions. The steel shell of the large blast furnace or smelter at Deseronto was built in their shops and erected also by them. They have built many of the mammoth steel tanks used in the cement plants in the vicinity of Belleville. Also, they have gone extensively into the manufacture of storage tanks, and car tanks for oil concerns. Another important department of their business is the supplying of boilers, engines, and steel whey vats for cheese factories. Belleville is the centre of one of the largest cheese districts in Canada and this department of Marsh & Henthorn's business is growing rapidly.

A railway siding runs directly into the Marsh & Henthorn yards, which is a great convenience for the shipment of heavy goods. For handling the latter a large derrick has lately been installed.

Mr. L. W. Marsh.

Altogether, the plant is an exceptionally interesting one, and certainly the works fabricated therein reflect credit upon its enterprising owners.

A brief biographical sketch of the founders of this firm will doubtless be interesting. Mr. L. W. Marsh was born at Frankford, Ont., in 1871. He is an undergraduate of Toronto University and of the Institute of Chartered Accountants. In February, 1897, in conjunction with Mr. Henthorn, he took over the business of the G. & J. Brown Manufacturing Company, and it is significant that the output of the firm has trebled since that time. Unlike many successful business men, Mr. Marsh is a man of several parts. From 1903 to 1907 he occupied the position of alderman in the Belleville City Council. In January, 1908, he was defeated for the mayoral chair by 29 votes, but successfully contested the office in January of this year, being elected by a majority of 185 votes in one of the liveliest elections in the history of this city. Mr. Marsh has done good work in the volunteers, in which he holds the rank of major. It is understood that he will shortly assume the command of the Fifteenth Regiment.

Mr. W. H. Henthorn.

Mr. W. H. Henthorn is the senior member of the firm in regard to years, having been born at Ellenburg, N.Y., in 1857. From the outset of his career Mr. Henthorn has been trained as a practical man, not that there is to be inferred from this anything detrimental to his business capacities, but that he combines with the latter a thorough working knowledge of his products in every phase of their manufacture. Early in life Mr. Henthorn was apprenticed to W. T. Bartley & Company, Montreal. Having utilized his time to good advantage here, he obtained a position as journeyman at the Caledonian Iron Works, Montreal, where he remained for ten years. In March, 1888, he removed to Belleville to take charge of the machine shop of the G. & J. Brown Manufacturing Company, a step that was destined to prove an important one, for nine years later he formed a partnership with Mr. Marsh and assumed the duties of mechanical superintendent of the present firm..

A. C. Leslie & Company, Limited, dealers in iron, steel and metals, 560 St. Paul street, Montreal, Que., have favored the "Contract Record" with a useful and original souvenir in the shape of a telephone directory cover, attached to which is a list of suggestions which should be of considerable interest to the trade.

Remember that business neglected is business lost And also that whatever your business, do it well.

Enterprise at Hagersville, Ont.

Quarries of the Hagersville Contracting Co., Ltd.

Municipal engineers and others, but municipal engineers in particular, should entertain for the Hagersville Contracting Company, of Hagersville, Ont., feelings not unmixed with gratitude, in that this progressive concern is producing materials which are able to set at rest all doubts in the preparation of specifications for such work as highways, culverts, etc. We take pleasure in publishing a brief account of this industry:

The Hagersville Blue Stone Quarry, Hagersville, Ontario, operated by the Hagersville Contracting Company, was opened by Mr. J. H. Porter in 1874-5, who took out stone for his own residence in Hagersville. During the following winter, 1875-6, he put two men quarrying and they took out about 150 cords of stone, going down through the top stone into the blue rock, which was really the first stone taken out of the quarry for commercial purposes. The quarry was operated at this time by taking the stone down to the G. T. R. yard and this continued until 1880, when a siding was put in on the M.C.R. property alongside of their main track by Chief Engineer True, of the M.C.R., Mr. True having succeeded Mr. Gossage, who was chief engineer of the Canada Southern Railway. About 3,000 cubic yards of stone was taken out in this year by Contractor Essen for culverts, etc., on the line of the Canada Southern Railway, which had then been leased by the M.C.R.

At this point in the history of the quarry, however, there was considerable difficulty experienced in getting freight rates on the G.T.R., which would enable Mr. Porter to do business outside of Hagersville, and for this reason, together with the high switching charge from the G.T.R. to the C.S.R., and vice versa, the business had been small in volume.

In 1886 Mr. Porter sold the quarry to D. C. Beattie, and it was operated by Lynch & Beattie and by Mr. Beattie himself until 1892 under similar conditions. A siding was put into the quarry from the M.C.R. in this year and in the neighborhood of 300 cars of stone were shipped to St. Thomas for street purposes. This stone was not crushed, but was laid on the street in large pieces and covered over with gravel. This method of making roads, however, did not prove satisfactory. The gravel soon ground into mud and the large flat pieces of stone came to the surface, making a very unsatisfactory roadbed. It now began to seen that crushed stone was the only thing for St. Thomas streets. Mr. A. W. Campbell, now Deputy Minister of Public Works, and Commissioner of Highways for Ontario, was at that time city engineer of St. Thomas, and he began looking around for crushed stone for the streets, with the result that the quarry passed into the hands of J. C. Ingles in May, 1893. The quarry was operated by Mr. Ingles for nearly nine years, during which time, owing to the introduction of crushing machinery and the demand for crushed stone, the volume of the business considerably increased.

During the early part of 1902 Mr. Ingles decided that it would be better to organize into a stock company, and the Hagersville Contracting Company was organized and the quarry leased to them. Since then the business has greatly increased, until now for the past four or five years there has been an average of 50,000 tons, or 1,500 carloads of stone shipped each year. The quality of the stone for street purposes is unquestioned, being superior to anything found this side of the granite regions of Ontario, and the stone has been used for street purposes in Toronto to the east, and Windsor on the west, and by a great many of the towns and townships lying between these points. The quality of the stone as road metal is fully attested by the main streets in Hagersville, which have been laid with macadam for about 12 years. Although it has not cost the municipality $12 in that length of time, it is now in practically as good condition as when it was laid. This local evidence of the quality of the stone, together with the numerous recommendations of those who have used the stone on their roads, should bring an ever increasing amount of business to the company.

The Toronto Electrical Maintenance Company, 24 Adelaide street west, Toronto, have established special departments for the inspection of power plants and electric light installations. They are prepared to submit estimates and furnish expert advice showing how a saving of 25 per cent. on electric light charges may be effected. Special attention will be given to the maintenance of power plants, which will be inspected, periodically, at a minimum rate, by contract. The company have installed modern electrically-driven machinery for repair work and are thereby enabled to handle their contracts with satisfaction and dispatch. The management has been entrusted to Mr. T. W. Sheffield, A.M.I.E.E., a gentleman of extended experience in connection with electrical undertakings. For five years Mr. Sheffield was district manager for one of the largest branches in Great Britain of the General Electric Company of New York. Mr. W. H. Jackson, of Toronto, who is well versed in the economical up-keep of power plants and lighting services, has been engaged as engineer.

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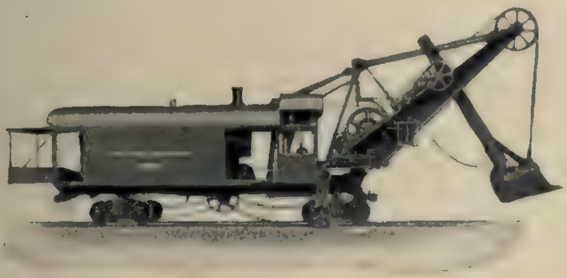

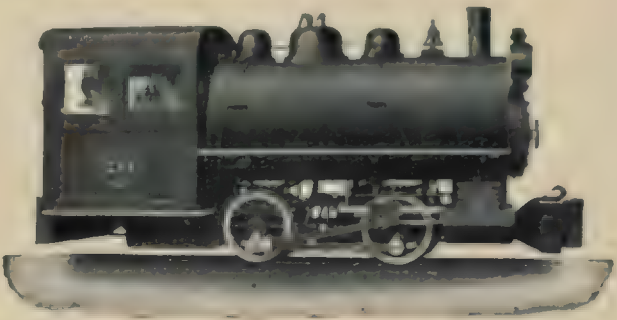

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Investigation of Clay Products

What would appear to be a most important extension of the structural materials investigations which have been carried on by the U. S. Government for several years has recently been determined upon. These investigations, as is generally known, have had for their object the determination of the nature and extent of the materials available for use in the construction of Federal buildings and the manner in which they can be used to obtain maximum efficiency. The proposed extension in this work will include investigations of clays and clay products undertaken by the United States Geological Survey, Technological Branch. The ever-increasing scarcity of wood renders self-apparent the fact that at no distant day a substitute for this most useful material of construction must of necessity be produced. With this necessity in prospect the investigation of clay products is about to be undertaken, and the results will be awaited with keen interest. A full investigation of this material will undoubtedly embrace a consideration of manufacturing problems and it is to be hoped that greater perfection will be made possible by their solution. While there exist beyond question many and undeniably great advantages peculiar to clay products as materials of construction, there have been noted from earliest times certain defects, whose presence can scarcely be detected before use of the material, and the effects of which are ruinously injurious. Probably efflorescence appearing on brickwork has caused more annoyance and expense and marred the appearance of more structures than any other one defect of the material. If the experts succeed in infallibly overcoming this fault or imperfection without unduly increasing the cost of the material great benefit to the clay products industry will inevitably accrue, and if some form of the material were evolved that could fairly be considered a substitute for wood, the result would be little less than revolutionary.

Painting Over Cement

It is not safe to paint over the surface of cement until it has stood exposed to the weather for about one year, unless the surface has first been sized with acid water to kill the alkali, and even then there is some danger of bad results. Here is a somewhat tedious method for preparing and painting such a surface, but it has the sanction of some of the best painters, says the "Master Painter": Slack one-half bushel of fresh stone lime in a barrel and add in all 25 gallons of water; when slacked and cold add six gallons of the best cider vinegar and five pounds of best dry Venetian red. Mix well and then strain through a fine wire strainer. Use it when about the consistency of thin cream. Give the cement surface a coat of this, and after standing a day or so apply a coat of red lead and linseed oil paint. After this has dried you may paint the surface any color you wish. Some jobs require two coats of paint over the red-lead paint. In this case make the second coat of paint serve as filler and paint both. This second coat may be made with plaster of paris and oil of the consistency of buttermilk. Then break up some white lead and oil to make a paint of the same consistency as the plaster paint. Now take equal parts of each of the two mixtures and "box" them together and thin to a working consistency with turpentine. This second coat should be applied as heavy as possible or as heavy as you can spread it well. After this coat is dry, apply your next and finishing coat of paint, which should be quite glossy, or about as you would for the last coat on woodwork outside. The object in giving it this plaster paint is to prevent the running and wrinkling of the paint where considerable paint is to be applied to the surface. And it must be made to dry quickly.

In these days of rapid building it is a very easy matter for carpenters and builders to rush their work and unintentionally neglect the seemingly unimportant things, but which eventually might spoil the entire job. They seem to forget that the little things about the house often bind the entire structure together into a perfect whole, while to neglect these would result in the ruination of the building. When building it is a wise plan to remember that this is not the last house you expect to build or the last season you expect to work, but that the quality of the work you do at present will largely govern the amount of work you will have in future. While building your houses build a reputation at the same time, for upon the quality of your work will depend the quality of your reputation.

A movement is on foot among members of the Canadian Manufacturers' Association to persuade the Ontario Government to do away with juries in Division Court cases. It is held that in cases in which farmers are the defendants the local feeling is often so strong that verdicts given for the defendants are plainly unjust.

The eight-hour day bill has met with so much opposition that it is considered probable that it will not be heard of again at the present session of Parliament.

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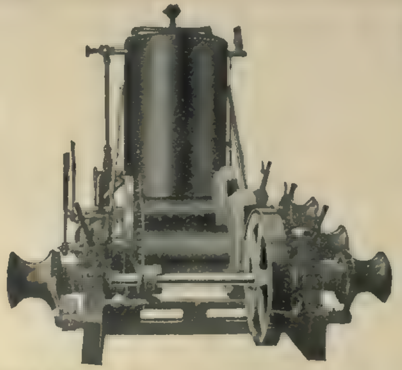

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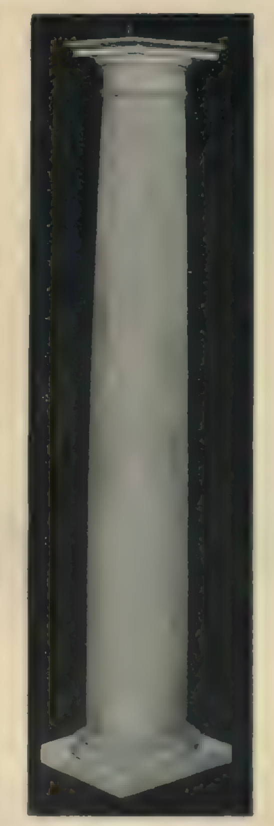

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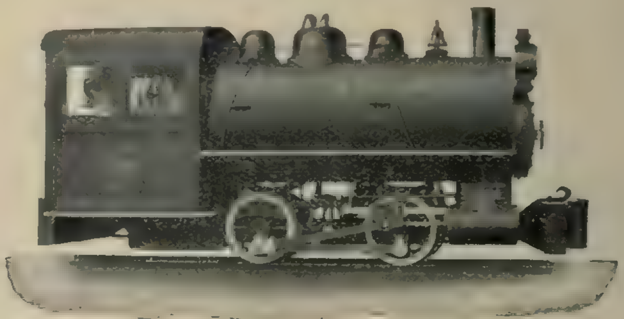
Designed for hard service on contracting work and switching around industrial plants.

Large boilers, ample size bearings, and all parts built to withstand rough usuage.



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FINISHED REPAIR PARTS CARRIED IN STOCK AND SHIPPED IMMEDIATELY ON RECEIPT OF ORDER.

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IS FLAT

Don't confuse "Galt" Lath with the old fashioned, baggy metal laths that are still used on some buildings because a fire-proof lath is required and the Architect or Plasterer doesn't know that a **flat** lath is made.

Every sheet of "Galt lath is flat—no buckles, no bags, no bulges, no bad ends, no waste.

The process of manufacture makes each sheet **flat** and **rigid** as a board. The strands are corrugated and provide a "key" that holds plaster on walls or **ceiling**

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A modern necessity in Factories, Stores, Banks, Offices, Gymnasia, Colleges and Public Institutions.

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They are made of sheet steel, with expanded metal or solid steel doors; key or combination locks; solid steel partitions and backs. D.L. Standards are the best locker value ever offered in this country.

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which lays up without lap, goes about eight per cent. farther, and is, from this one feature alone worth about eight per cent. more than lath which laps in laying up. The Herringbone selvage edge avoids side lap. We give you without billing it 1½ in. additional length to provide for end lap.

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We are specialists in the manufacture of these goods and our prices are right.

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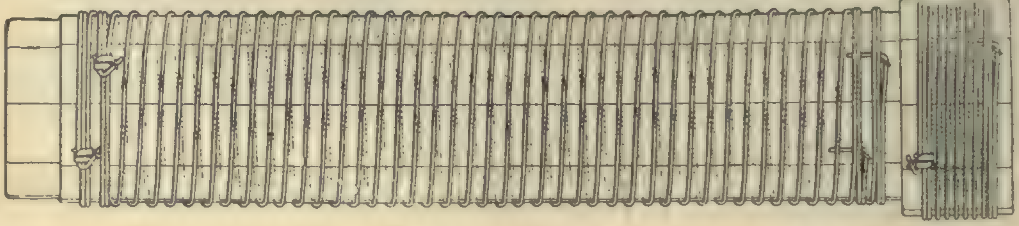

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The Dominion Wire Wound Wood Water Pipe

Showing special method of winding with two independent parallel wires. The great advantage of this is that in event of one wire becoming damaged the pipe still retains a factor of safety of 2.5. Made only by

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The "Midland"
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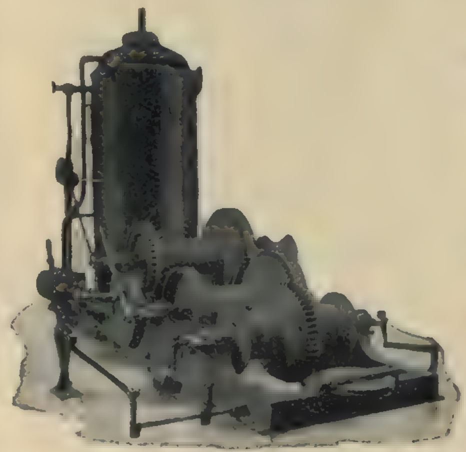

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Our latest Catalog tells all about our **Special Builders' Engine** on page 11. Send for one

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Built in the best manner and of material that can be depended upon. They will be found to fully sustain the high reputation of

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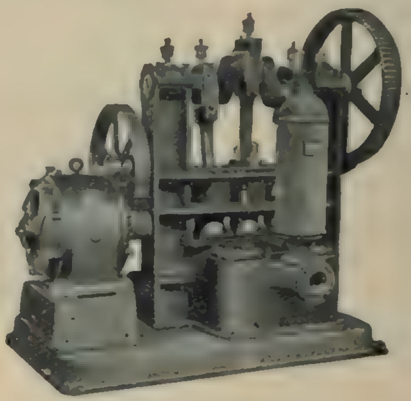

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Learn about the strongest, most practical, most durable and easiest-laid culvert ever made—that's

PEDLAR CULVERT

Perfect Corrugated Galvanized

"For more than five years I have been experimenting with our experts to find the BEST culvert for all-round uses. We sought the markets of the world for one that was just right; and we didn't find it. If we had, we'd have bought the patent rights for Canada. Finally, last spring we struck the idea. Then we put in some expensive months in making that idea better, —and NOW we've got a culvert that is so far ahead of any other there's no comparison."

"You'll read something about it here; but to KNOW how 'way-ahead it really is, you'll want to see the sample (sent free) and read the booklet (free, ditto). With that before you, you will soon see why every Reeve, or Warden, or Town Councillor, or anybody who has any use for culverts at all,—will find it pays to get in touch with me right NOW. I am asking you to lay aside your notions of what makes a good culvert, and a cheap culvert, and find out about this NEW culvert. I don't expect you to buy a foot of it until it PROVES to you that Pedlar Culverts are in a class by themselves, and that you can't afford to overlook them. Let us start that proof toward you soon—address nearest Pedlar place."

G. H. Pedlar

A structure like this, with Pedlar Culvert, won't wash out nor need repairs.

A few hours' work and a few dollars will put a modern and permanent culvert in place of a ramshackle bridge. Easily laid by anybody.

Made of Special Billet Iron, Extra Heavy

In every size of Pedlar Culvert, which comes in all standard diameters from 8 inches to 6 feet, we use nothing but the best grade of Billet Iron, specially made for us, of extra-heavy gauge (14 to 20 gauge, according to the diameter). This Billet Iron is curved into semi-cylinders—curved COLD, so there will never be any variation from exact dimensions; and it is then deeply and smoothly corrugated on a special press that puts a pressure of SIXTY TONS on every square inch of the metal. The corrugations, therefore, are uniform and very deep.

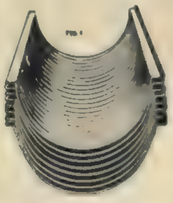
Galvanized After Being Pressed Up

When the corrugating process is done, the sections are galvanized by our exclusive process that covers the entire surface with a thick coating of zinc spelter. Every edge, every crevice, is heavily coated with this rust-proof, corrosion-proof galvanizing, not a spot is left unprotected. This is the **only** culvert galvanized **after** being shaped. Is absolutely **Rust-proof.**

Will Stand Incredible Strains

The heavy-gauge Pedlar Billet Iron sections, deeply corrugated and locked together **without bolts or rivets** by our compression triple-rib (this rib is flat—not corrugated), make a culvert that will stand enormous crushing strains and neither give nor spring. A thin cushion of soil on top is all the protection such a culvert needs against traffic; and no special precautions need be observed in laying it,—it will stand what no other culvert can.

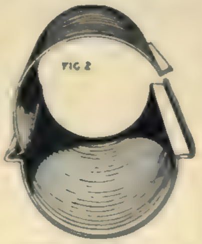
Compact—Portable Easily Laid



Half-sections nested for shipment

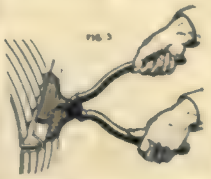
Pedlar Culverts are shipped in half-sections, nested—see Fig. 1. Saving freight charges and making carriage easy in roughest country. Quickly and easily transported anywhere.

Note that the ribs are flat, and the curved part of the cylinder deeply corrugated. These ribs add vastly to the culverts' strength.



Sections in course of assembling

Unskilled labor, with a single tool, quickly clamps the flanges together, making a triple-fold joint that is tighter and better than any riveted or bolted joint can be.



Clinching the flange-lock — no bolts, no rivets, no makeshifts

Frost-Proof, Rust-Proof, and Wear-Proof

This triple-rib flange-lock principle, found only in Pedlar Culverts, not only adds greatly to the strength of the piping and makes a perfect joint—practically as good as if welded—but it also allows for expansion and contraction under cold or heat. Though a Pedlar Culvert, of any length, be frozen solid full of ice, it will not split nor spring a leak.

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Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Kildonan, Man.
Extensive sewer work is contemplated.

London, Ont.
A tile sewer will be laid in English street and on Central avenue.

Montreal, Que.
Plans have been ordered to be prepared by the civic water committee for the widening of the aqueduct and the construction of a new steel intake pipe from the middle of the St. Lawrence river to the new covered aqueduct, to cost $750,000.

Owen Sound, Ont.
The council is considering an expenditure of $100,000 to augment its water supply by drawing on the Sydenham river at a height of 300 feet above the level of the city. This will afford a gravity system, giving pure water with plenty of pressure for purposes of fire protection. The engineer believes that the filtration plan is feasible in this case and his report to the Owen Sound Council will embody a recommendation to that effect.

Quebec, Que.
Tenders addressed to W. D. Baillairge, Cty Engineer, will be received until April 14th for supply of following materials for the city during the next fiscal year, from May 1st, 1909, to May 1st, 1910: broken stone, macadam, unbroken stone, stone curb, forge work, retaining walls, stone and brick pavements, stone and brick sidewalks, sand, nails, deals, etc. Further information on application.

Saskatoon, Sask.
Tenders close April 20th with J. H. Trusdale, City Clerk, for the following: One stone crusher of 10 to 20 tons per hour capacity; elevator complete; one set of screens; a set of bins and a 10-ton road roller.

Victoria, B.C.
A blyaw to raise $50,000 for a new water works system will be submitted to the ratepayers at an early date.

Winnipeg, Man.
The National Transcontinental Railway have obtained permission to lay a sewer on Nairn avenue. The city will pay its share of the outlet cost, which will amount to about $10,000. The trunk sewer outlet will run from Roland to Orleans, where the commission will connect with its own sewer. The length of the outlet is about 400 yards and this portion will cost $20,000, the city paying half. The cost of the sewer, five miles in length. which will be laid by the commission to the shops at Transcona, will be about $170,000.

C. J. Brown, City Clerk, gives notice of the city's intention to carry out local improvement works comprising plank walks, cedar block pavement and sewers at an estimated cost of $33,500.

City Engineer Ruttan has presented to the Board of Control his report on cost of constructing sewers. Combined intercepting sewers from Colony and Assiniboine avenues to Red River north of city, including Cornish street system, $1,225,000, or storm sewers in same section for dry weather flow only, $400,000. For combined intercepting sewers from Assiniboine river at Clifton street to Red river north of city, including capacity of that portion of Ward 1, west of Cambridge street, $3,077,080; sanitary sewers for same section for dry weather flow, $750,000.

AWARDED.

Edmonton, Alta.
F. M. Crosskill, City Secretary Treasurer, states that the contract for sewer pipe for the year 1909 has been awarded to the Ontario Sewer Pipe Company, Limited, of Mimico, Ont. Bids for water pipe for the year have not yet been received.

Fort Frances, Ont.
Debentures amounting to $25,000, of which $20,000 are for waterworks and $5,000 for local improvements, have been awarded to G. A. Stimson & Company, Toronto.

Haileybury, Ont.
$6,000 five per cent., 30-year debentures, issued for sewerage work have been awarded to G. A. Stimson & Company,t Toronto.

Montreal, Que.
The Roads Committee have awarded the following contracts for laying and supply of material for the paving of the streets of the city during 1909, as follows: Asphalt pavement and paving blocks, Sicily Asphalt Company and Barber Paving Company; scoria blocks, F. D. Lawrence; N. Y. blue flagstones, F. D. Lawrence and Laurin & Leitch; Danforth flagstones, La Compagnie de Construction des Pavages Modernes; curbstones, B. Beaucage, F. D. Lawrence and L. Giguere; laying flagstones, L. Giguere; laying flagstone crossings, Leclaire & Payette; laying scoria blocks, F. D. Lawrence; asp;halt in bulk, Elder Albano Company.

Ottawa, Ont.
The following contracts have been awarded for waterworks supplies for 1909 at Ottawa: Hydrants and valves, Thomas Lawson & Sons, Ottawa, $2,644; cast iron pipe, T. Sidney, Kirby & Company, $15,065.10; lead pipe, McKinley & Northwood, $1,306.77; brass goods, James Robertson, Montreal, $987.95.

Sarnia, Ont.
Tenders addressed to H. A. McLean, Town Engineer, will be received until April 17th for construction of concrete walks and curbs and for supply of Portland cement, vitrified and concrete sewer tile. Specifications may be seen on application.

Toronto, Ont.
City Engineer Rust will require $190,000 to extend the city water service along St. Clair, Danforth, Riverdale and Carlaw avenues, and along Gerrard street east from the present terminus of the existing main. The money will be provided by an issue of debentures.

Vancouver, B.C.
The contract for supplying the city with sewer pipe has been awarded to Evans, Coleman & Evans, at $43,620.19 for material delivered. O'Neill & Company tendered at $44,615.25 for pipe f.o.b.

Winnipeg, Man.
The Board of Control will recommend to council that the contract for supplying the city with the season's sand be divided between the Eli Sand Company and the Marchand Sand Company, a contract to be made with each company for from four to ten thousand cubic yards at $1.05 per cubic yard.

The Board of Works have accepted the tender of Thomas Jackson & Son for a sewer on Machray avenue, from Main street to St. Cross, at $1,624.

Public Buildings, Churches, Schools, etc.

Brandon, Man.
The Brandon Curling Club will erect a club house and rink at an estimated cost of about $20,000.

Bella Coola, B.C.
A new $3,000 hosiptal will be erected here.

Brantford, Ont.
Tenders addressed to J. H. Ham, Chairman, Building and Grounds Committee, will be received until April 21st for improveemnts to the police court building. Plans at the office of B. W. Hall, architect.

Chatham, Ont.
The Board of Education has decided to proceed with the proposed addition to the collegiate institute. Wilson, Son & Arnold, architects, are drawing the plans, and the structure will cost between $15,000 and $20,000.

The Dresden Public School Board is securing plans for a new school building.

T. J. Rutley is architect for a new Presbyterian manse in Harwich.

Coquitlam, B.C.
Tenders are about to be called for the new Hospital for the Insane. Architect, H. S. Griffiths, Victoria, B.C.

Chamberlain, Sask.
A stone school house costing $2.400 will be built in this village this spring.

Galt, Ont.
The ratepayers will vote on a bylaw to raise $20,000 for an addition to the General Hospital.

The Galt Free Methodists will shortly ask for tenders for the erection of a new church.

The ratepayers will vote on bylaws to raise $15,000 for an addition to the Cen tral school and $20,000 for a new wing and improvements to the hospital.

Hamilton, Ont.

Bids are about to be asked for erecting the Y. W. C. A. building. Charles Mills, 2 1-2 James street, architect.

The Congregation of Zion tabernacle are endeavoring to raise funds for the erection of a $14,000 Sunday school.

Kenora, Ont.

The Kenora, Ont., Town Council is negotiating for the construction of a court house in that town.

London, Ont.

City Architect Nutter is busy at work on the plans for the additions to the Wortley road school.

Milverton, Ont.

Andrew Carnegie has agreed to donate to the village the sum of $7,000 for the erection of a public library building, with music hall, providing the village supply a suitable site.

Montreal, Que.

Plans have been completed for the extension of the Y. W. C. A. building at an estimated cost of $75,000. Work will be started shortly.

Nesterville, Ont.

Tenders addressed to W. Mitchell will be received until May 10th for the erection of a school building for the trustees of S. S. No. 3, Lefroy. Plans and specifications at office of Clinton Bros., Thessalon, or of Mr. Mitchell.

Port Burwell, Ont.

Tenders addressed to A. Ribbell will be received until April 20th for enlarging and remodelling the school house at this place. Plans and specifications may be seen at the store of L. Fay, Port Burwell.

Perth, Ont.

The Y. W. C. A. have purchased a site fo a new association home.

Portage la Prairie, Man.

J. E. McKechnie has just taken tenders for the erection of a brick veneer Methodist church.

The Government have purchased a site for the proposed armory and public building.

Rocanville, Sask.

A new Methodist church will be erected at this place.

Richibucto, N.B.

Tenders close April 20th with C. J. Desbarats, Acting Deputy Minister of Marine and Fisheries, Ottawa, Ont., for the construction of a wooden lifeboat house. Plans may be seen at the post offices at Richibucto, Buctouche, Newcastle and Shediac, N.B., and at the Department.

Regina, Sask.

The Order of the Grey Nuns have been granted a free site in the west end of the city and will erect a new hospital to cost $115,000.

Shoal Lake, Man.

Tenders addressed to Dr. A. J. Fraser will be received until April 26th for all trades in the erection of a brick veneer church with stone basement. Estimated cost, $7,000. Architect, A. F. Nesbitt, Shoal Lake.

Sherbrooke, Que.

The C. P. R. intend to build a new station at Sherbrooke to cost $9,000.

St. Thomas, Ont.

The Board of Education is asking for $3,218 for repairs to various school buildings during the current year.

Treherne, Man.

James Chisholm, architect, Winnipeg, has completed plans for a Methodist parsonage to be erected at this place for Rev. Mr. Lewis at a cost of $3,000 to $4,000.

Toronto, Ont.

E. J. Lennox, 164 Bay street, is working on plans for the improvements contemplated in Victoria Hall on Queen street east.

The Separate School Board will erect a four-room brick school at East Toronto. C. Reid, architect.

Symons & Rae, architects, have plans for the new $20,000 edifice to be erected by the congregation of Christ Church, Deer Park.

$250,000 has been bequeathed with which to erect a building at Toronto to be known as the Burns Memorial.

Vancouver, B.C.

It is stated that a new theatre will be erected in this city by S. S. Snubert, of New York.

Winnipeg, Man.

The Lake of the Woods Yacht Club will build at once. G. W. Weltwood, architect.

J. D. Matheson, local manager for Warren & Wetmore, architects, has plans for the new C. N. R. depot at Port Arthur.

Herbert Matthews, architect, has plans for a small addition to the Central Congregational Church.

Smith & Bruce, architects, have completed plans for a new theatre on Dufferin avenue for P. A. Crump & Company.

It is stated that the Orpheum theatre circuit will erect a theatre in this city.

Tenders addressed to P. E. Ryan, Secretary, Transcontinental Railway Commissioners, Ottawa, Ont., will be received until April 27th for the construction of station buildings, section and tool houses between Lake Superior Junction ond Winnipeg. Plans and specifications at offices of Hugh D. Lumsden, Chief Engineer, Ottawa, Ont., and S. R. Poulin, District Engineer, Winnipeg.

Yorkton, Sask.

J. H. Russell, architect, Winnipeg, has nearly completed plans for the $15,000 Presbyterian church to be erected here this season.

AWARDED.

Brantford, Ont.

J. Holman, Plattsville, has been awarded the contract of building the Bruce School, the contract price being $2,500.

Medicine Hat, Alta.

J. E. Lussier has been awarded thec ontract for alterations to the Montreal street school.

Port Haney, B.C.

The contract for improvements to the municipal hall has been awarded to E. J. Crickmay, of this place.

Residences

Calgary, Alta.

The city building inspector has issued permits to W. R. Eveleigh for two houses in Sunnyside, $2,000; David Jones for one house in Bankview, $1,500; Benson & Houlton, two houses, $2,500; J. H. Haynes, brick terrace on First street east, five apartments, $8,000; Wm. Reid, $2,500 residence, and Lea & Goulding for a $2,700 residence.

Fort William, Ont.

Tenders addressed to R. E. Mason, architect, this city, will be received until April 15th for the construction of a semi-detached residence. Plans may be seen on application.

Montreal, Que.

Plans are being prepared by J. Seath Smith, architect, 207 St. James street, for the erection of an additional apartment house for Mr. Duncan.

Wright & Son, architects, 204 St. James street, are preparing plans for the erection of eight flats on Mance street, Montreal Annex, for Mr. W. H. Christian.

Outremont, Que.

James E. Adamson, architect, Coristine Building, is preparing plans for the erection of a residence in Outremont for Mr. Munro.

Ottawa, Ont.

Tenders will be invited about the 14th inst. for the erection of an apartment house for the Imperial Realty Company. H. C. Stone, architect, Montreal.

London, Ont.

Work will be started at once on several new houses to be erected by Arthur McClary on Queens avenue.

Henry Pocock is erecting 22 houses in the east end of the city.

Sherbrooke, Que.

C. Bernier, architect, Montreal, Que, is preparing plans for alterations to cottage at Snowdon Junction for Dr. Ostiguy, Sherbrooke.

Saskatoon, Sask.

F. H. Webb has started excavating for an apartment block.

Amongst those who have signified their intention of building residences this year are Hon. A. P. McNab, A. H. Hanson, Magistrate J. Jackson, B. H. Timmins, H. H. Elford, J. Priel, H. M. Earle, B. A. Archibald, S. R. Ross, W. Houlding, C. Wentz, A. H. Shannon, J. G. Nicholson and W. Murphy.

Toronto, Ont.

Dr. Weismiller has purchased the lot on the corner of King street and Dowling avenue. It is understood that a large apartment house will be erected on the site.

Recent building permits include: G. V. Burgess, two storey and attic brick dwelling, Balmoral avenue, $3,500; W. P. Near, pair semi-detached two storey and attic brick dwellings, Shannon street, $4,400; W. H. Howard, two pair semi-detached two-storey rough cast dwellings, brick fronts, Pape avenue, $5,000; G. L. Thompson, pair semi-detached two storey brick dwellings, Dufferin street, $4,000; J. T. & H. Hutson, pair semi-detached two storey and attic brick dwellings, Farnham avenue, $5,000; J. T. & H. Hutson, pair semi-detached two storey and attic brick dwellings, corner of Woodlawn and Farnham avenue, $4,500; A. Brock, two storey and attic brick dwelling, Rusholme road, $3,000; Roberston & Summers, pair semi-detached two storey and attic brick dwellings, Marmaduke street, $5,600; Jas. Wright, pair semi-detached two storey and attic brick dwellings, College street, $4,500; R. C. Vaughan, two storey and attic brick dwelling, Dunvegan road, $6,500; A. Norman, two pair semi-detached two storey and attic brick dwellings, Concord avenue, $9,000; Rev. M. P. Talling, two and a half storey brick dwelling, Oriole road, $4,000; John Laing, pair semi-detached two storey brick dwellings, Logan avenue, $4,000; John Hastings, three attached two and a half storey brick dwellings, Symington avenue, $4,200; J. E. Peterkin, two pair semi-detached two storey brick dwellings, Brock avenue, $8,000; W. H. Marks, pair semi-detached two storey brick dwellings, Margueretta street, $3,000; R. J. Lightie, two and a half storey brick dwelling, Mackenzie crescent, $4,000; R. A. Shields, pair semi-detached two storey brick dwellings, Sydney street, $4,800; Rev. J. Bushell, two storey and attic brick dwelling, Brooklyn avenue, $3,200; R. C. Bustard, two detached two and a half storey brick dwellings, corner of Spadina and Lowther, $4,000; Allan W. Pike, two storey and attic brick dwelling, Concord avenue, $3,000; Harry Johnston, two storey and attic brick dwelling, Wright avenue, $3,000; George Eccles, pair semi-detached two storey and attic brick dwellings, Howard Park avenue, $4,000; N. Hilliary, two and a half storey brick dwelling, corner Bernard and Admiral road, $10,000; R. Y. Maybee, two and a half storey brick dwelling, Bloor street west, $8,000; Samuel Nordheimer, two and a half storey brick dwelling, Poplar Plains road, $4,600; A. Miller, two detached two storey and attic brick dwellings, Spencer avenue, $6,000; Edwards & Saunders, two and a half storey brick dwelling, Wilson avenue, $5,200; C. S. Boone, two storey and attic brick dwelling and stable, Crescent road, $26,000; T. P. Loblaw, two storey and attic brick dwelling, Lonsdale avenue, $3,000; Wm. Dunseath, pair semi-detached two storey and attic brick dwellings, Givens street, $4,000; H. S. Mara, three detached two and a half storey brick dwellings, Hawthorne avenue, $10,500; J. R. Gifford, two storey and attic brick dwelling, Parkway avenue, $3,400; Wm. T. Harris, two storey and attic brick dwelling, corner Broadview and Bain, $15,000; A. G. Love, pair semi-detached two storey brick dwellings, Ossington avenue, $4,000; Mr. Harman, pair semi-detached two storey brick dwellings, Lippincott street, $3,500; E. G. Switzer, two pair semi-detached two storey brick dwellings, Lynd avenue, $7,500; Jos. Bryant, pair semi-detached two storey and attic brick dwellings, Delaware avenue, $4,500; E. P. Atkinson, two detached two and a half storey brick dwellings, Marmaduke street, $7,500; Salvation Army, one storey brick hall, corner Queen and Tecumseth street, $3,000; E. P. Atkinson, pair semi-detached two and a half storey brick dwellings, College street, $6,000; T. P. Stewart, 7 detached two storey brick dwellings, St. Clair avenue, $21,000; Caroline Lakey, pair semi-detached two storey brick dwellings, Delaware avenue, $4,000; R. Robson, two pair semi-detached and one detached dwelling on Dufferin avenue, $9,000.

Winnipeg, Man.

George Lindsay will erect a $5,000 house at Armstrong's Point.

J. H. Russell, architect, this city, has plans for a new $45,000 apartment block for Crichton & Company.

A permit has been granted to A. J. Geeves to erect a $3,500 dwelling on the west side of Walnut between Broadway and Preston.

J. D. Windrum has secured a permit to erect a residence on the east side of Wellington Crescent, between River and Stradbrooke place, at a cost of $6,000.

AWARDED.

Montreal, Que.

MacDuff & Lemieux, architects, 205 St. James street, have awarded the general contract for the erection of a residence on St. Antoine street for T. Costello, to Jos. Michel.

R. Montgomery Rodden, architect, 8 Beaver Hall Square, has awarded the following contracts for the erection of a conservatory on Argyle avenue for W. H. Dorkin, as follows: Cement, brick and concrete walks, T. A. Moore; carpentry, Thos. Forde; plumbing and heating, W. J. Graham; painting and glazing, J. N. Arcand; roofing, Richardson & Simard; electric wiring, Mr. Watt.

The general contract for the erection of an apartment house on St. Joseph Boulevard for Mr. Desjardins has been awarded to Gray & Wighton, contractors, 7 Park avenue. Contract for plumbing and heating still open.

J. Seath Smith, architect, 207 St. James street, has awarded the contract for excavations, masonry and brick work, for the erection of the Murray apartment house on Mackay street to James Young, contractor, Outremont.

Ross & MacFarlane, arcihtects, 1 Belmont street, have awarded the following contracts for the alterations to a house at 806 Sherbrooke street west, for Mr. R. Archer, as follows: Masonry and brickwork, Reid, MacGregor & Reid; carpentry, D. M. Long; plumbing and heating, H. A. Brasseault; plastering, John Morrison; painting, A. Craig; roofing, Campbell & Gilday; electrical work, Philip Lahee & Company.

Westmount, Que.

R. Montgomery Rodden, architect, 8 Beaver Hall Square, has awarded the contract for excavations, masonry and brickwork for the erection of two houses on Roslyn avenue, for W. T. Rudd, to John Stewart & Company, general contractors, 153 Hillside avenue, Westmount.

Business Buildings and Industrial Plants

Beamsville, Ont.

H. A. Metler, St. Catharines, proposes to establish a basket and box factory at this town.

Berlin, Ont.

Witte Bros. & Company, of Newark, N.J., will next year build a branch factory for the manufacture of cloth-covered buttons, and dies.

Carberry, Man.

Dr. Henderson will shortly erect a horse exchange building. A new hotel is planned by Mr. Gillespie, of the Royal hotel.

Chesterville, Ont.

The buildings of the Chesterville Record, W. Saucier, G. Robinson and others were destroyed by fire last week at a total estimated loss of $100,000.

Esquimalt Harbor, B.C.

A wealthy syndicate, whose personel has not yet been divulged, plans to build large sawmills at an expenditure of over $300,000.

Fort William, Ont.

Tenders addressed to R. E. Mason, architect, this city, will be received until April 14th for a business and office building at West Fort William.

Guernsey, Sask.

O. A. Snider, hardware merchant, will erect a new store.

Halifax, N.S.

The saw mills at this place, owned by L. N. Frechette, were destroyed by fire last week at heavy loss.

London, Ont.

A delegation from this city and St. Thomas will go to Pittsburg this week to interview A. C. Dinkey, president of the Carnegie Steel Company, in regard to the proposed establishment of a Canadian branch.

Montreal, Que.

Joseph Sawyer, architect, 401 Guy street, is preparing plans for alterations to property on Atwater avenue, for Mr. Alf. Leduc.

Theo. Daoust, architect, 103 St. Francois Xavier street, is preparing plans for fixtures and interior decorations of new stores of Messrs. Beauchemin, Limited, St. James street.

Tenders were taken up to the 12th inst. for alterations to property on Centre street for Mr. James Conroy, of Conroy Bros., plumbers. Wright & Son, architects, 204 St. James street.

Alphonse Piche, architect, is preparing plans and inviting tenders for the conversion of property at 148 Peel street into stores, including extensions and general repairs for the Stanley Bagg estate.

Marchand & Haskell, 164 St. James street, are preparing plans for an eight-storey bank and office building to be erected for the Banque Nationale on St. James street. L. DeGuise, Montreal, is manager.

Moose Jaw, Sask.

R. G. Bunyard, architect, wants tenders until April 15th for a three storey brick addition and alterations to the premises of Mitchell, Hembroff and Maybee.

New Glasgow, N.S.

A new industry called the Harris Forge Company, capitalized at $25,000, will locate here. Modern forge shop machinery will be immediately installed, to manufacture shape and drop forgings.

New Westminster, B.C.

It is understood that the Board of Trade will take active steps toward the establishing of an elevator here.

A Hamilton nail and wire concern and a Winnipeg metal fencing company will likely build branch plants in this city.

Ottawa, Ont.

Plans are being prepared for a large departmental store to be erected on the site of the Brunswick hotel.

The Nichols Chemical Company, Limited, of Montreal, have deposited with the Minister of Public Works, plans for a proposed dock on Bussard Inlet.

Pembroke, Ont.

The building of Dunlop & Company, hardware merchants, was recently destroyed by fire, together with four houses belonging to Fenton & Smith. Estimated loss $100,000.

Prince Albert, Sask.

G. Albrechtson has plans ready for the Agnew Hardware Company's new block.

Sarnia, Ont.

It is said that Detroit capitalists will establish automobile works at Sarnia this year.

Saskatoon, Sask.

A. L. Haining, of St. John, N.B., was recently in the city in connection with establishing a branch warehouse here for Emerson & Fisher.

Shedden, Ont.

J. G. Stormes will erect a carriage factory at this place.

(Continued on page 23)

Tenders and For Sale Department

Town of New Liskeard

Waterworks

Tenders will be received by the undersigned until the 15th DAY OF APRIL, 1909, for the supplying of Cast Iron Water Pipe and other Castings, Valves, Hydrants, and for excavating and refilling Trenches and Laying Pipes, Setting up Hydrants, etc., for the extension of the New Liskeard Waterworks System, there being about seven thousand nine hundred feet of six inch and four inch pipe to lay. Plans specifications of the work, etc., form of agreement and bond may be seen and form of tender may be obtained at the office of C. H. Fullerton, Town Engineer, New Liskeard.

H. HARTMAN,
Clerk.

New Liskeard, March 10, 1909. 15

Tenders Wanted

City of Saskatoon

Sealed tenders addressed to the undersigned will be received until 5 o'clock p.m., WEDNESDAY, APRIL THE 28th, 1909, for the following:

(a) One Brick, Steel or Concrete Smoke Stack with a height of 100 feet and inside diameter of 66 inches, together with corresponding smoke connection to boilers.

(b) Bricking in 2-250 Horse Power Robb Mumford water tube boilers.

Plans and specifications may be seen at the office of the Electrical Superintendent.

A marked cheque for $100.00 must accompany tender.

The lowest or any tender not necessarily accepted.

E. L. WHITE, J. H. TRUSDALE,
Electrical Superintendent City Clerk. 16

CITY OF SASKATOON
Province of Saskatchewan

Tenders for

Excavating and Pipelaying

Sealed tenders will be received by the City Clerk until 8 p. m. on TUESDAY, APRIL 13th, 1909, for all labor necessary for laying Water Mains and Sewer Pipes, and furnishing certain materials therefor according to plans and profiles dated April 1st, 1909.

Plans and specifications may be seen at the office of the Chief Engineer, 103 Bay street, Toronto, or at the office of the City Clerk, Saskatoon, on and after April 1st, 1909.

WM. HOPKINS, Esq., J. H. TRUSDALE, Esq.,
Mayor, Saskatoon. City Clerk, Saskatoon.
WILLIS CHIPMAN, C. E.,
103 Bay street, Toronto, Ont. 15

City of Saskatoon, Sask.

Tenders for

Road Making Machinery

Sealed tenders will be received by the City Clerk, until 5 o'clock p.m. on TUESDAY, APRIL 20th, 1909, for the following:

1. One Stone Crusher of 10 to 20 tons per hour capacity.
2. One Elevator complete.
3. One Set Screens.
4. One Set of Bins.
5. One Ten Ton Road Roller.

For further information apply to the City Clerk.

J. H. TRUSDALE,
City Clerk.

Saskatoon, March 22nd, 1909. 15

To Architects

The town of Parrysound contemplates erecting a Town Hall, and would like to correspond with architects with a view to suggestions and sketches. Particulars from

E. E. ARMSTRONG,
16 Clerk

CITY OF PRINCE ALBERT

Tenders

Sealed tenders addressed to the undersigned and marked "Tender for Pipe-laying," will be received until 8 P.M. on FRIDAY, APRIL 30th, 1909, for the following work.

Taking up 8 inch wooden stave pipe on River Street and First Street, Goschen, between Fifth Avenue East and Graham Street and re-laying with 8 inch Cast Iron Pipe

Specifications may be seen and forms of tender obtained at the office of the City Engineer.

C. O. DAVIDSON,
Secretary-Treasurer.

Prince Albert, March 25th, 1909. 15

To Paving Contractors

The City of St. Catharines intend paving certain streets and invites final tenders for paving one or more of same either in

Vitrified Brick
Asphalt Block
Sheet Asphalt
Bitulithic
Westrumite

Sealed tenders addressed to the Chairman of the Committee on Works will be received by the City Clerk untill 15th APRIL, 1909, at noon.

Plans and specifications may be seen and form of tender obtained at the City Engineer's Office on and after 3rd, April.

Each tender must be accompanied by an accepted cheque or cash deposit for the sum of Four Hundred Dollars.

The lowest or any tender not necessarily accepted.

D. BENZIE, C. E.,
City Engineer.

St. Catharines, 31st March, 1909. 15

Town of Estevan

Province of Saskatchewan

Tenders Wanted

Sealed tenders will be received by the Secretary-Treasurer until

Wednesday, May 19th,

for constructing a

Water Works System and Main Sewer

comprising 7,300 feet of Water Mains, 2,400 feet of Tile Sewer, also **Steel Water Tower, Gasoline Engines, and Power Pump.**

Plans and specifications may be seen at the office of the Secretary-Treasurer, Estevan, or of the Chief Engineer, 103 Bay Street, Toronto, on and after April 22nd.

No tender necessarily accepted.

L. A. DUNCAN. Esq. WILLIS CHIPMAN, C. E.
Secretary-Treasurer, Chief Engineer,
16-18 Estevan, Sask. 103 Bay St., Toronto, Ont.

Tenders

will be received up till noon, TUESDAY, THE 20th INSTANT, for all trades required in the erection of a Bank Building, corner College and Dovercourt.

The lowest or any tender not necessarily accepted.

Plans and specifications may be seen at the office of the Architects.

DARLING & PEARSON.
15 2 Leader Lane, Toronto.

Debentures for Sale

Tenders will be received by the undersigned up to SATURDAY, THE FIFTEENTH DAY OF MAY, A.D., 1909, for the purchase of Eleven Thousand ($11,000.00) worth of Debentures of the town of Durham bearing interest at the rate of 4½ per cent per year, running for a period of twenty years. Interest and principal payable in equal instalments of $845.64.

WM. B. VOLLET, Clerk,
17 Town of Durham.

Wanted

Names of Electrical Firms who are prepared to take up the manufacture of an electrical device requiring light machinery. Correspondence confidential.

Box 718
Contract Record, Toronto

17

Positions Wanted or Vacant

WANTED—Job as well driller, good tool repairer. Address Box 65 Milverton, Ont. 15

WANTED—GRANITE-CUTTER AND LETTERER; steady job. HAYES BROS., St. Mary's. 15

ENGINEER AND ELECTRICIAN desires position, ten years experience of steam and electrical machinery; temperate and reliable. Address C. J. JACKSON, 200 Terauley street, Toronto. 15

WANTED—At once—Foreman upstairs department planing mill; must understand stair work; an all-round man, aquainted with machinery and general requirements of building trade; handle men to advantage; state experience wages expected. GARDINER & SON, Galt. 15

Business Opportunities

ADVERTISER would like to meet an experienced Electrical Salesman with capital to invest in small business handling well-known high-class lines, and having excellent prospects. Substantial interest for right man. Box 714 CONTRACT RECORD, Toronto. 15

Miscellaneous

VALUABLE LIME ROCK and crushed stone property for sale; forty-five acres; adjoining G.T.R. track on south side, Rockwood. JAMES A. HAMILTON, Rockwood P.O. 15

Conduit

Tenders for Underground Conduit will be received up till APRIL 30TH, by the City of Toronto, Canada. For specifications and form of tender apply Electrical Department, City Hall.

Business Buildings and Industrial Plants

(Continued from page 21)

Sherbrooke, Que.

The Joseph Bowman structural steel concern may locate in Sherbrooke if that city grants certain concessions.

Strathcona, Alta.

Dr. S. Archibald is planning the erection of a business block. A. H. Richards & Company will also build.

Sydney, C.B.

The Marine and General Engineering Company will go on with the erection of its plant and open up for business at once.

Three Rivers, Que.

Daoust & Lafond, architects, Three Rivers, are preparing plans for the erection of a store and dwelling for Nap Lamy. Plans are also being prepared for the erection of two stores and dwellings for Mr. Bournefal.

Toronto, Ont.

C. M. Essery will build three brick stores and dwellings on Lansdowne avenue at a cost of $9,000.

A pair of $7,000 brick stores and dwellings are to be erected on College street by Dr. Thos. Butler.

A pair of brick stores and dwellings will be erected on Roncesvalles avenue by J. S. Sharpe at a cost of $6,000.

The Copp Clark Company have obtained a permit for a two storey brick store house on Wellington street west to cost $30,000.

James Fulton will erect a pair of semi-detached three storey brick stores and dwellings on Spadina avenue at a cost of $4,500.

The Traders Bank have obtained a permit for alterations to their premises at the corner of King and Spadina; estimated cost $4,500.

H. McCarten has a permit for the erection of a pair of semi-detached two storey brick stores and dwellings on Queen street east. Estimated cost $5,000.

The Scarboro' Athletic Grounds Company have a permit for the erection of a one-storey brick and concrete grand stand on Queen street east to cost $4,000.

C. S. Boone has purchased number 317 Wilton avenue. The property is now occupied by a restaurant. When the lease of this expires Mr. Boone will erect a large modern building.

A permit has been obtained by R. T. Smith for the erection of three attached two storey brick stores and dwellings and three stables on Roncesvalles avenue at a cost of $6,000.

The building on the south side of King street, just east of the Princess Theatre, has been purchased by Clatworthy & Company, who will erect a machine shop in the rear of the premises.

The Expanded Metal & Fire Proof Company will build a one storey addition to their factory on Fraser avenue at a cost of $4,500. The same company will build a two storey brick garage and workmen's residence on Fraser avenue at a cost of $8,000.

Mr. L. Solman will shortly commence the construction of an eight storey hotel, with one hundred bedrooms and bathrooms, on the site of the present hotel owned by him at the northeast corner of King and Simcoe streets. The front of the building will be of cut stone, and will be designed somewhat after the fashion of the King Edward. H. Simpson is the architect. The plans are all ready for the commencement of construction, which, it is expected, will start next month.

Victoria, B. C.

Extensive alterations will be made to the Silver Spring Brewery at this place. R. H. Ulrich, architect.

P. Burns & Company, who have purchased the meat business of R. Porter & Son, contemplate extensive improvements.

Lim, Bang & Company, a wealthy Chinese firm, are to erect a large brick block on Government street. The building will have twelve spacious stores on the ground floor, the top floors to be offices and rooming apartments. Construction is to commence at once. Another Chinese firm are to build a block on Broad street, to cost $20,000.

Welland, Ont.

The Building, Lumber & Supply Company, composed of well known Orillia men, will put up a large factory here. The factory and yards will cover four acres.

Winnipeg, Man.

W. R. Milton will build a large addition to his bakery on Nena street.

The government will erect a new telephone exchange this season at a cost of $35,000.

It is stated that the Globe Iron Works, of Winsconsin, have decided to build a plant in this city.

The Williams Machinery Company plan to erect a $40,000 four storey warehouse on Princess street. John D. Atchison, architect.

The Winnipeg Excelsior Mills have obtained a permit for the erection of a factory on Poplar avenue. Estimated cost $23,000.

The Claudy Manufacturing Company, of Zanesville, Ohio, manufacturers of school furniture, will locate a branch in this city and ultimately erect a branch factory.

An apartment block, that is expected to cost $40,000, is being planned by J. H. G. Russell for J. Crichton & Company. It will be erected on Edmonton street, near Portage avenue.

H. M. Millman is reported to be making arrangements for the erection of a large block on the southeast corner of River avenue and Osborne street. The ground floors would be occupied by a bank and stores.

The T. Eaton Company have taken out a permit for the new warehouse to be erected on the northeast corner of Hargrave and Graham. The warehouse will be of brick and four storeys high, costing $60,000. G. Thompson, of Toronto, is the builder.

Several important inquiries have been received by the Winnipeg Development and Industrial Bureau recently from manufacturers who seek to locate in this city. These include a large machinery firm of Johnstown, Pa., an Iowa firm that makes agricultural machinery and tools, a leading iron works of the State of Winsconsin, one of the old and reliable manufacturing concerns of Glasgow, Scotland, a Montreal firm that makes architectural and interior iron work and brass fixtures, a big hardware making house of Pittsburgh, Pa., and a large shirt-making firm from Troy, N.Y.

Woodstock, Ont.

The Watt Coupler Company may build a factory here.

AWARDED.

Montreal, Que

L. Vaillancourt & Company, carriage makers, have awarded the contract for the installation of a large carriage elevator to Cote Bros. & Burritt.

The contract for the alterations and repairs to freight elevator for Fraser Viger & Company, has been awarded to Messrs. Cote Bros. & Burritt, 52 Conde street.

Cote Brothers & Burritt, millwrights, 52 Conde street, have been awarded the contract for the installation of a large freight elevator for the Merchants' Cotton Company, St. Henri.

MacVicar & Heriot, architects, 104 Union avenue, state that D. G. Loomis & Sons, general contractors, have been awarded the contract for the erection of the Eveleigh factory in St. Henri.

D. G. Loomis & Sons, general contractors, have been awarded the general contract for two additional buildings for the Mount Royal Spinning Company at Cote St. Paul. Finley & Spence, architects, Guardian Building.

Toronto, Ont.

The John E. Webb Company have been awarded the general contract for a drug store and dwelling on Howard Park avenue for Mr. W. R. Hoar. Estimated cost $10,000. Only the masonry work has been sub-let to date.

Railroads, Bridges and Wharves

Duncan, B.C.

The C. P. R. will build a new depot here.

Port Arthur, Ont.

The C. N. R. have obtained important concessions to construct a line from Sellwood to this city. Construction must be started within a year.

St. Johns, Que.

The C. P. R. are to replace the present single track bridge over the Richelieu river with a modern double track steel bridge. Plans and estimates have been prepared so that the necessary appropriations can be made, etc.

Toronto, Ont.

Wm. M. Gardiner, of Walkerville, and A. B. Scott, of Detroit, Mich., representing a Detroit and Canadian syndicate, are reported to be making arrangements for the construction of a railway from Bruce Mines to a point on the Grand Trunk Pacific Railway, a distance of about 100 miles.

The provincial government has made the following railroad grants: 4,000 acres per mile to C. N. R., for 500 miles of railway from Sellwood to Port Arthur; $5,000 per mile for 30 miles to the Manitoulin and North Shore Railway, between Little Current and Sudbury; 7,400 acres per mile to the Algoma Central Railway, between the Soo and Michipicoten Harbor; $3,000 per mile for 15 miles to the Central Ontario Railway; 1,000 acres per mile for 7 miles to the Ontario and Western Railway, in Thunder Bay district; 1,000 acres per mile for 20 miles of railway, from Keewatin to Kenora.

Vancouver, B.C.
Mr. G. A. McNicholl, purchasing agent of the Grand Trunk Pacific Railway, is calling for tenders for the construction of concrete abutments, piers and pedestals for six steel bridges to be built this summer on the 100-mile section of the main line between Prince Rupert and Copper river. Tenders must be in before April 24th.

Winnipeg, Man.
At a recent meeting of the Parks Board, a committee consisting of Ald. Midwinter, H. S. Stovel, J. W. Handel and C. W. Sharpe, was appointed to obtain estimates of the cost of constructing a pontoon bridge over the river at Assiniboine park. The street railway company will be aswed to aid in the construction of the bridge.

AWARDED.

Moncton, N.B.
Heber M. and Clair M. Young, Taymouth, have been awarded the contract for building the embankment and culvert at Stanley, the contract price being about $1,000.

Montreal, Que.
The G. T. P. have awarded to the Montreal Locomotive Works, Longue Pointe, a contract for twenty-five eight wheel engines, to be delivered next July. The weight of these engines on drivers is 74,060 pounds, total weight of engine and tender loaded 264,988 pounds. An order has also been placed with the Algoma Steel Company, Sault Ste. Marie. for 22,000 tons of eighty pound steel for rails. In addition to this the Grand Trunk Pacific have ordered from the Dominion Steel and Iron Company, Sydney, C.B., 13,000 tons, eighty pound steel rails and 2,000 tons of sixty pound rails, sufficient to lay 21 miles of track intended for sidings.

North Toronto, Ont.
The contract for the 140 foot timber bridge at Lawrence Heights was awarded to D. M. McLennan, of Weston, at $3,995. Bridge was 24 feet high and bents rested on concrete piers. Other tenders were as follows: Messrs. McKenzie, Lansing. $4,400; Farrell & McCarthy, Toronto, $4.700; Green & Sinclair, Toronto and Owen Sound. $4,797; Gale & Company, Oshawa and North Toronto, $5.000; Mr. Kirby, Toronto, $5,382; Peter Arnot, Toronto, $5.682; W. S. Oliver & Company, Toronto. $6,064; R. MacManus & Company, Hamilton, $6,736; Engineers' approximate estimate. $4,850. Walter Scott Brooke, Assoc. M. Inst., C.E., etc., Engineer.

St. Thomas, Ont.
Tenders for the construction of the Philmore and Jamestown bridges and for the work of furnishing and driving piles at the new Port Stanley breakwater, were submitted to the Elgin County Council, as follows: Jamestown Bridge.—Superstructure — R. McManus. $2.073: Petrolea Bridge Company. $2,370; C. E. Stafford, $1,892: J. W. Chivers, $1.900; J. McCandless. $1,961: J. Vincent, $1,594.75; Scoyne & Remey, $4.098; Walker & Williams, $2,438.85: J. T. Harper, $3.225. Steel work—Canadian Bridge Company. $3,320; Petrolea Bridge Company. $3,250; Hamilton Bridge Company, $3.300; Harris & Company, $3,760: R. McManus, $3,312; Jenks & Dresser. $3,390. The contract of the Petrolea Bridge Company for steel and of Joseph Vincent for superstructure was accepted. Philmore Bridge — Superstructure — R. McManus. $1 883: Petrolea Bridge Company, $2,205; O. D. & A. L. Oatman, $3,300: C. C. Stafford, $2,300; J. W. Chivers, $1,700; L. McCandless, $1,878; Jos. Vincent, $1,892.80; J. T. Harper, $2,996. Steel — Canadian Bridge Company, $3,800; Petrolea Bridge Company, $3,725; Hamilton Bridge Company, $3,670; Harris & Company, $4,225; Jenks & Dresser, $3,820; R. McManus, $3,758. The tenders of J. W. Chivers for superstructure and of the Hamilton Bridge Company for steel were accepted. Port Stanley Piling.—Furnishing 250 piles — John McGuigan, $2.00 each; J. R. Gunning, $398 for all; E. A. Earnshaw, $2.95; C. F. Jackson, $2.06 1-2; M. H. Penhale, $1.75; H. E. Johnston, $3.00; N. E. Burton, $2.90; J. H. Smale, $1.82; R. Moore, $625.44 for all; H. M. Ellison, $388 for all. Driving 250 piles — John McGuigan, $2.75 each; J. R. Gunning. $598; J. H. contract to drive the piles and H. M. Ellison, $2.03 each. J. H. Smale received the contract to drive the piles and H. M. Ellison the contract for furnishing piles.

Winnipeg, Man.
The Canadian Pacific Railway Company is reported to have awarded contracts to build four branch lines in Saskatchewan and Alberta provinces. Three were let to Foley, Welch & Stewart of St. Paul, Minn., from Lethbridge east, from Stettler and from Outlook, and the extension from west of Weyburn to John Dutton.

Tenders have been received for the National Transcontinental Railway bridge at Winnipeg. The tenders are: J. J. Collins, V. W. Geroux, T. Kelly & Sons, Faulkner, McDonald and Bender, Haney, Quinlan & Robertson, Toronto Construction Company, Wm. Newman & Company, Limited, J. D. McArthur, Canada Foundry Company, Limited, and Dominion Bridge Company, Lim-

Power Plants, Electricity and Telephones

Alameda, Sask.
The organization of the Alameda Rural Telephone Company has been completed, and plans call for the immediate construction of 68 1-2 miles of rural telephone lines for 60 subscribers.

Brandon, Man.
The City Council has applied to the municipality of Winnipeg for service from its civic power plant at Point du Bois, which is about 200 miles from this city.

Brockville, Ont.
The Beach Company, of Iroquois, have valuators out arranging to purchase a pole route for an electric power line from Iroquois to Brockville.

Bienfait, Sask.
The Bienfait Rural Telephone Company has been organized, with A. E. Watt as president and Ira F. Brown, secretary-treasurer, to construct a rural telephone system.

Calgary, Alta.
It is reported that the Calgary Power & Transmission Company will commence work immediately on its proposed power development at Horseshoe Falls, which will involve an expenditure of more than $1,000,000.

Cranbrook, B.C.
The Board of Trade has petitioned the provincial government to build a telephone line through the Kootenay country.

Creston, B.C.
The Goat River Power Company have secured permission for the construction of a 10-mile tramway to Duck Creek.

Cochrane, Alta.
The Calgary Power & Transmission Company, of Calgary, Alta., has entered into an agreement to supply the town of Cochrane with electricity for lamps and motors. The company is also negotiating with several other towns to furnish electrical service.

Condie, Sask.
Tenders addressed to N. Henderson will be received until April 15th for construction of the Condie rural telephone system.

Duncans Station, B.C.
The Portland Canal Mining Company is making arrangements for the installation of a power plant, aerial tram and concentrator at an approximate cost of $75,000. C. H. Dickie is president of the company.

Edmonton, Alta.
The provincial government will build eight hundred miles of telephone lines this year.

Elk Lake, Ont.
The Silver Belt Telephone Company, Limited, has obtained a charter with a capital of $40,000.

Fernie, B.C.
The Cranbrook Telephone Company, of Cranbrook, B.C., have decided to build a telephone line between Fernie and Lethbridge.

Fort William, Ont.
The farmers of Paipoonge Township are organizing to secure a rural telephone system, which will be connected with this city and also with Port Arthur. For further information address Dr. D. C. Garver.

Govan, Sask.
The organization of the Govan Rural Telephone Company has been completed, and tenders for the construction of a telephone system will be called for soon.

London, Ont.
It is announced that the London Street Railway Company expects to use additional power for the coming summer season, but it has not yet been decided as to what kind of electrical equipment will be installed. C. B. King, manager.

Manor, Sask.
Plans are being made to organize a local and rural telephone company in Manor. For further information address W. G. Bell.

Midland, Ont.
It is officially announced that the Simcoe Electric Railway & Power Company, Midland, will begin this year the construction of an electric railway to connect Penetanguishene, Midland, Victoria Harbor, Waubashene and Coldwater. The company expects to build a power plant at Big Chutes, on the Severn river. It is the intention to furnish power for lighting purposes. Capital stock authorized, $500,000. Bonds authorized, $400,000. Provisional directors:—James Playfair, Douglas L. White, W. Finlayson, Midland; W. J. Sheppard, Waubaushene, and W. J. Lovering, Toronto.

Montreal, Que.
The Bell Telephone Company, of Canada, has appropriated $1,000,000 for improvements and extensions during the year 1909.

Sir Thomas Shaughnessy states that the C. P. R. will make a number of experiments with electrical storage locomotives on the western lines of the company this year.

Application is being made for the incorporation of the Canadian, Liverpool and Western Railway Company with powers in addition to the construction of railways, to distribute electrical power. For further

(Continued on page 41)

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The Situation and the Labor Question

According to reports at hand from all sections of the country there is every indication that the optimistic predictions made earlier in the season are sure to be realized. From Ontario and Quebec, from the prairies, from "Sunny Alberta," and British Columbia, in brief, from coast to coast, comes the glad word of returning prosperity and of prospects than which none were ever brighter. Toronto is a notable example. The permits issued during March of the present year amounted to $1,703,840, a record for this month in the history of the city. A feature of this record is that it is not padded with the figures for any large public buildings. In March, also, Winnipeg, with a total almost within hailing distance of seven figures, established a new high water mark for the month.

Toronto and Winnipeg have many competitors in the race back to prosperity. For instance, in proportion, there is quite as much doing in Saskatchewan, and possibly more, for after reaping a bountiful harvest last year, nearly every city, town and hamlet in that province is experiencing the joy of a building boom. Vancouver, also, and Victoria are scenes of exceptional trade activity. With these pleasing facts before them, the building fraternity may go ahead with every confidence of a successful season. The confidence, however, must be of the sane kind. No liberties must be taken. Above all, as we pointed out in a previous issue, must every effort be made by labor to preserve harmony.

The following is a recent dispatch from Winnipeg: "Builders and contractors anticipate serious labor troubles during the present year. Unless they are speedily adjusted, they will cause a setback to what is anticipated should be a record year. The bricklayers will demand 62½ cents per hour, an increase of 2½ cents over the price paid last year. The master builders are meanwhile drawing up a new wage scredule, which provides a reduction of 5 cents per hour. The carpenters are now getting 35 cents, but will ask 40 cents per hour in their agreement. Nothing definite has been decided with regard to what the plasterers will require, but it is understood that they will ask 55 cents instead of the 50 cents they are now receiving." Unhappily, Winnipeg is not an isolated example. Disquieting rumors are to hand from Edmonton and other points. Every effort should be made to avoid this kind of trouble.

A depressing effect will inevitably result if there is any extended effort on the part of labor to secure higher wages this season. The season promises much and if there is general co-operation, reason and confidence the best will be realized.

The Demand for an Adequate Time Limit

With an extensive programme of public works outlined this season a word or two regarding an evil in the letting of contracts which has arisen in recent years is timely. Reference has frequently been made in these columns to various wrongs that require setting right, both as to tendering for contracts and as to awarding them, but, hitherto, attention to the question of obtaining an adequate time limit on public works has not been given the space which it merits.

Many of our readers have, at some time or other, been up against the difficulty of having to prepare, within a week, a bid for a job which, properly, should engage them in close investigation for a month. The more annoying part of it is that often that particular job has been discussed and held over by a dilatory committee for weeks at a stretch before the hurried call for tenders was given. It would seem as if some of the authorities had realized that in the letting of the contract lay their only chance for making up for lost time. Occasionally we know that such mistakes are made through carelessness or ignorance, but in the light of past experience it may be safely said that these causes are in the minority and that generally they are attributable to lack of system and previous dilatoriness.

From one evil always arise others, sometimes of greater and sometimes of lesser magnitude, but more often of greater. When contractors are not offered sufficient time for the preparation of their estimates it may be taken for granted that some of them will not tender at all. Here we have a greater resultant evil, for if any contractors are compelled to withhold their bids the tendency towards injudicious bidding is increased and the possibility is reduced of letting the contract on the best terms and on a basis which is fair to the man who "pays the piper." In the wake of injudicious bidding come scamped work, litigation and other troubles. Again, higher prices usually prevail where a contract is let at short notice

A contract of any magnitude should be advertised so widely and within such a length of time of the letting as to secure the serious attention of all contractors who wish to bid upon it and to allow them time for a thorough investigation of the work contemplated; and the time between the letting and that when the contract goes into effect should be sufficient to permit the fullest preparation for carrying it out.

The authorities would have to take no revolutionary measures to secure this to the contractor. A little more system, a little more preparation, a little more forethought, and the thing would be accomplished.

Meeting of Architectural Institute

Educational Matters Discussed by
Mr. J. P. Hynes

A meeting of the Architectural Institute of Canada was held in the rooms of the Ontario Association of Architects, Toronto, on April 6th. The business meeting of the council was held in the morning, when a number of applications for membership were dealt with and other matters of routine taken up. The general meeting of the institute was then held, at which a number of associates, fellows, honorary members and corresponding members were elected. Mr. J. Z. Resther, of Montreal, was elected vice-president in the place of want to ask your advice in constructing a septic tank, the late Maurice Perrault.

An interesting address was given by Mr. J. P. Hynes, F.A.I.C., upon educational matters. Mr. Hynes pointed out that historically art was first taught by apprenticeship, and that as early as the sixteenth century in Italy the academic idea of teaching art was introduced and continued to develop until to-day we had the Beaux Arts Society of Paris as the recognized academic training institution, not only of Paris, but largely of the continent and even for this side of the water. Architects must necessarily develop their education on the art side in contra-distinction to the scientific side. This had been already acknowledged by Columbia University, which does give a student a four or five years' course in architecture, but provides that the student must earn his standing by developing meritorious work even at the expense of spending more years in the course.

Mr. Hynes pointed out that the Carnegie Institute, under the direction of Mr. Hornbostel, took a strong position, that architecture must be studied as an art and that therefore all the scientific principles recognized in the universities must be eliminated. No degrees were given by the Carnegie Institute and no set time was required of the student in the course. They were awarded mentions according to the merits of the work produced and if not sufficiently studious or capable, to merit these mentions, they were simply dropped from the course. This develops a thoroughly artistic atmosphere where the student was not trammelled by arbitrary rules, hours or requirements, and in which their individual temperaments were encouraged to develop to the utmost.

A point worthy of the attention of the profession in Canada was that the best academies in England were not supported by the profession, but by the governments. The profession in Canada should see that the governments which undertook the higher education of the people, also undertook the higher education in architecture, which really was not part of the business or duty of the profession itself. The educational standing set by legislation could not be procured on any ground other than that of sanitation and construction, as no English-speaking legislature had yet undertaken to legislate that a man must qualify in art before earning his living by architecture. It was therefore detrimental to the higher ideals of the architectural profession that any legislative standard should be enacted, as it was an anomaly to style a man an architect when he was only qualified on the scientific side and had had no training or development on the artistic side.

Mr. Hynes' address was greatly appreciated by those present.

In the afternoon a convention was held between the representatives of the various Canadian architectural societies to discuss the question of federating with the Architectural Institute of Canada. The question was thoroughly discussed, but no definite action was taken, though it was pretty generally understood that the proposal was regarded as practical and could soon be actually accomplished.

In the evening a smoker was given at the galleries of the Ontario Society of Architects, where the visiting architects were entertained by several interesting addresses upon art subjects, by a number of musical selections, and by a splendid exhibition of architectural drawings, etc., which had been arranged by the Toronto Society of Architects. This exhibition was one of the most interesting which have ever been made in Toronto and reflected a great deal of credit upon those who got it up. The architectural section was represented by 221 exhibits and the arts and crafts section contained 105 exhibits. There were also 13 interesting loaned exhibits The work of the Toronto architects revealed a decided advance in many directions, notably in draughtsmanship and design.

The members of the institute were entertained at luncheon by the Toronto Chapter of the Ontario Association of Architects. Mr. George W. Gouinlock was in the chair, and among those present were: A. F. Dunlop, Montreal, president of the Architectural Institute of Canada; Alcide Chausse, Montreal, secretary of the A.I C.; J. S. Archibald, Montreal, representing the Quebec Association of Architects; J. W. Watts, Ottawa, representing the Ottawa Chapter of the Ontario Association of Architects, and Messrs. Geo. W. Gouinlock, W. A. Langton, Edmund Burke, H. B. Gordon, A. F. Wickson, Grant Helliwell, A. H. Gregg, F. F. Saunders, R. J. Edwards, W. R. Gregg, M. A. White, H. E. Moore, W. F. Sparling, J. Wilson Gray, J. P. Hynes, J. C. B. Horwood. Addresses were given by Messrs. A. F. Dunlop and J. S. Archibald, Montreal, and others.

The Science of Mixing Mortar

There are just reasons to marvel at the carelessness with which an average batch of mortar is mixed, and how soon it is placed on the walls of a structure. This is a matter that has been so long neglected that most of our builders are inclined to consider it in the light of a subject that has nothing to concern them beyond the mixing of the lime and sand. In this age of supposed progressiveness, when every detail is, or at least should be, given careful consideration the subject of mortar has been permitted to remain comparatively unnoticed, and the work of mixing the same left to almost anyone.

It is true that we are in a hurry, and that, in order to get our contracts completed, we must adopt the methods that will insure the quickest results. In this way there are liable to be some serious mistakes made, and to avoid these we must have due regard for all of the details. Mortar properly mixed and permitted to stand (this is the whole secret) will naturally insure excellent results when the same is applied to the walls of a building. How often is this done with care? Is it not the rule to mix the mortar and use it too soon? We make the bed, slack the lime, and in a day or so add some sand; then the plasterer goes to wook, and if the plastering falls off within a few months what else can we look for as a result of this haphazard method of work?

Anyone who has the least knowledge of lime and its properties is fully aware of the fact that it requires a certain temperature to properly disintegrate the same, and that the quality of the lime must be of the best to get the desired results. Over-burned or under-burned lime will be unfit for use where we hope for the best results, and this is, of course, the primary consideration But with good lime we must add care in the slacking of the same and also permit it to undergo the chemical changes which it requires before it will be in a state to give satisfaction.

Perhaps there are many who do not know that lime will undergo some chemical changes for some months after it has apparently been properly disintegrated or slacked. How we shall avoid the damage that will naturally ensue from these changes is a consideration that should be foremost in the mind of every builder. In Germany, for instance, the law requires the lime to be slacked at least six months previous to being used in mortar, and this is placed in wells especially dug for that purpose, where it may undergo these chemical changes, so that it is in a perfect state when it is mixed with the sand, and the plaster does not fall from the walls after being applied.

In this country it is the most common sight to see a laborer, one who has very little knowledge of lime, further than what he has learned from everyday experience, mixing the mortar on the street and the same being placed on the walls in a day or so later. What possible chance has the lime had to undergo any real chemical change? Is the mortar made in this way in a proper condition to be applied to the walls of a structure? The slightest consideration will readily convince one that there is grave danger of unsatisfactory results in such cases.

Why should we not have laws governing this matter? The contractor and builder owes it to himself that more care be taken in this respect. Our patent hard plasters, and wood fibre plasters where used, do away with this possibility, but there are so many cases where the common mortar is used that there should be some action taken by our municipal authorities and building departments regulating the time lime shall be used after it has been slacked. Is this not a theme that should be given a deeper consideration? We are too prone to permit this matter to be done in a way that will bring the least desirable results from our labors.

Consider that after the mortar has been placed upon a wall, when it has been mixed in the ordinary way, that there are continual changes undergoing in the ingredients, what are the results, and why does the plaster fall, causing loss, inconvenience and labor? We would have more regard for every other portion of the building, and there is no excuse why this portion of the structure should not be entitled to the same care as any other. There is but one way to obtain this end, and that is by co-operation on the part of every architect, contractor and builder to have laws made governing the same. It is a matter that has been treated too lightly in the past, and one that must be more carefully considered in the future, because there is reason for the matter being remedied What the builder wants is the best of everything in his line and his workmanship to be above reproach, and in this matter he can at least improve the condition of one feature, and the results will amply repay him for the labor entailed.

Let us add that it is not necessary to use sand in the mixing of mortar, because there are cases where ground limestone, crushed granite, or even crushed cinders, have made a most perfect component part to be used in conjunction with lime. The mortar made from any of the above commodities has been proven to give the most satisfactory results, and makes a hard, durable plaster. The cost, where sand is scarce, is such as to make it very reasonable, and it is a matter that is deserving of consideration, along with the foregoing question of improved mortar.—National Builder.

Solution of a Roofing Problem

To put corrugated iron roofing of No. 20 gauge or heavier upon a steel frame structure is not one of the easiest of jobs, especially if one has had no previous experience, says Oliver Twist in "Carpentry and Building." One method of doing such work when no sheathing is used and the iron has to be laid directly on the purlins is shown in the accompanying sketch. Fig. 1, of a section of such a roof, in which the purlins, which are of channel iron, are placed as shown and parallel to the side walls. This roof has a span of about 48 feet, more or less, and we used for the first row along the eaves, sheets 33 inches wide and 8 feet long, and above that three 6-foot sheets the same width, the purlin being spaced about 5 feet 4 inches on centres, so that the top end of sheet should reach to the top edge of purlin, as in fig. 1, and allow the next sheet above to overlap about 6 inches. Although this is all the bearing they have, two men can stand close together in the centre of supports without much deflection of the sheets.

To secure the sheets to purlin we use a roofing bolt, like fig. 2, passing through the ridge of corrugations and hooking under the steel as shown, using first a lead washer close to the galvanized iron sheet, fitting the bolt right, and then a galvanized iron washer and nut. These were put in every fourth corrugation and screwed down tight, taking care to have the bolt tight up against the top of the purlin. You will notice particularly that the bolt passes through the top sheet only, which allows for expansion and contraction of each sheet without tearing holes larger, and at the same time securing each sheet just as effectually as though it passed through both. The side seams are lapped two full corrugations.

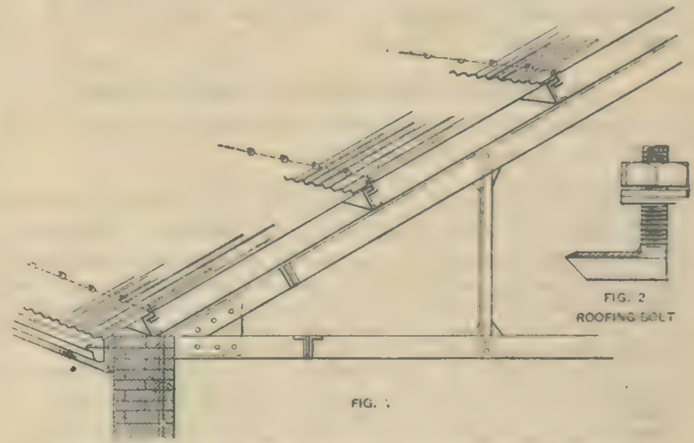


FIG. 2
ROOFING BOLT

FIG. 1

Placing Corrugated Iron Roofing on Steel Construction

The only piece of wood in the whole construction was a 2x10-inch piece along the eave, as shown in fig. 1, which was used to spike an ogee eave trough to, and which could be dispensed with by fastening hangers to end of galvanized sheets.

The following pertinent observation was recently made at an architects' meeting in New York City:

Amazing, the age of an architect's patrons! The average man, in fact, is 35 before he begins to save seriously; his pile isn't made till he is 50; he begins to build himself a house in his old age, and his funeral takes place about the time the painters are called in."

Can Good Doors Be Made of Norway Pine?

What the Manufacturers Say—Their Pros and Cons—Practical Pointers on the Subject

A question which has frequently been asked of the *Contract Record* is whether good doors can be made of Norway pine. Correspondents often state that they have trouble with it on account of its tendency to warp. They therefore use other woods such as white pine, Southern pine or cypress. With a view to obtaining the ideas of those who have had experience upon the question, enquiries were made of a number of door manufacturing companies, and some useful information was received in the replies. It appears from these that there is a strong objection to the use of Norway pine for the reasons stated, in some quarters, but that others who have studied the matter closely have come to the conclusion that a good door can be made from this wood if it is properly handled. Stress is laid more often than anything else upon the importance of having the wood thoroughly kiln dried. Several manufacturers in the Southern States are loud in their praise of red cypress for doors and believe that it gives more satisfactory results than any other. A number of the replies received in connection with this subject are published herewith and will make interesting reading.

In Favor of Using Norway Pine for Doors.

Those who believe Norway pine can be used successfully for doors write as follows:

The Bryan Manufacturing Company, dealers in lumber, lath, shingles, doors, etc., Collingwood, Ont., say:

"We have made large quantities of doors of Norway pine and have had no complaints of same warping and do not think they are nearly as liable to warp as doors made from Southern or Georgia pine, and if they are properly manufactured we think there will be little trouble from this cause.

"Our process of manufacture is to thoroughly dry-kiln material in the rough, then to rip it up and cut it to sizes and plane it out of wind on the buzz planer or jointed. This insures the door being straight and out of wind when leaving the factory, and, after that, if it is given the ordinary care that any panel door should have and not put into a damp building, we do not think it is any more liable to warp than a door made from white pine. We think you will find in a good many cases where people have had trouble with warping, that the doors have either been made from stock not thoroughly kiln dried or else it is not dressed out of wind in manufacture, in which case the door would be warped before leaving the factory. In our case we do not mortise and tenon our doors but put them together with hardwood dowels, which, we claim, makes a superior job and does not weaken the stile of the door nearly as much, and therefore it is not nearly so liable to warp, as if it was mortised and tenoned."

The G. W. Murray Company, Limited, Winnipeg, say:

"We have never attempted to manufacture doors out of Norway pine. At the same time, we think that the material can be made to answer the purpose if properly treated in the kiln-drying. British Columbia fir at present takes the place of most of the materials which would be used for natural finish, the Norway fir is consequently not a factor in the door business in this western country."

John Piggott & Sons, Windsor, Ont., say:

"We have made quite a lot of doors out of Norway pine and have always been very particular about selecting the stuff. When we get good material and dry, we do not find that it warps much more than any other wood, and if it comes out of good large logs we think it will stand as well as, if not better than, Southern pine."

Siemon Brothers, Limited, Wiarton, say:

"Our experience in this has been limited, but a firm which the writer worked for, made the doors out of cheap material glued up, and veneered them with Norway or Georgia pine, in fact anything, and that way makes the best door."

John Harrison & Sons' Company, Limited, lumber, lath and shingle dealers, Owen Sound, say:

"We get some very nice Norway or red pine here, which we find very suitable for inside doors. It is not nearly so hard or liable to warp as Southern pine."

Some Reasons Against Norway Pine Doors.

Those who do not favor the use of Norway pine for doors write as follows:

Ed. C. Nicholson & Son, contractors and builders, St. Catharines, Ont., say:

"We have never made or used a door made of Norway pine material, as it is not satisfactory to work. It is too heavy. The fibre is too dense. It is too easily splintered and warps and twists. It will not stay straight after sawing. For instance, take a 2-inch plank 8 x 10 inches wide. Saw through the centre. It will either go convex or concave. It is given to checking and has too much sap, which discolors and turns green. We have made some sash with Norway, but they were not satisfactory. Norway is all right for framing in buildings, where it is covered up, such as timber jointing, sheeting, etc., but not for finishing. It does not take the paint very well. The paint is apt to peel off. We have used it for flooring but if left bare and washed frequently it soon gets very dirty and begins to peel."

The Gilmour Door Company, Limited, Trenton, Ont., say:

"Neither Norway nor yellow pine makes a satisfactory solid door, because both of these materials warp badly. White pine holds its shape better. We never make any solid Norway doors, but sometimes use Norway panels and yellow pine panels in white pine framing. These panels are held straight in the grooves of the framing. We make a great many solid yellow pine doors, but in most cases persuade our customers to permit us to build the framing up in three parts, which construction gives it a less tendency to change its shape. The only way to overcome the twisting or warping of lumber is to make it up with glue in two or more parts, i.e., the principle of the veneered door, and even then they will sometimes change their shape under very trying conditions."

The M. Brennen & Sons Manufacturing Company, Limited, wholesale dealers in lumber, lath and shingles, Hamilton, Ont., say.

"In our opinion neither Southern pine nor Norway pine is suitable for making doors, excepting for the panels. We use both the Southern and Norway pine for the panels, some people prefer the Southern pine to the Norway pine for panels. We find that the Southern pine for panels is more liable to twist and split than Norway."

"We do not think either Norway or Southern pine would be suitable for stiles or rails of doors, and we have not attempted to use either of these except on one or two occasions some time ago, when they gave very poor satisfaction."

The Schultz Brothers Company, Limited, contractors and builders, Brantford, Ont., say:

"We make nothing but a No. 1 door, and in our experience soft white pine is about the only thing that can be relied upon for rails and stiles, not to spring or warp, except cypress or cedar, which is sometimes used with very good results.

"Norway would make a very poor material for doors on account of its being so hard in nature, and the same might be said of Georgia or Southern pine. Where Georgia pine or any other particular finish is wanted, it is customary for us to veneer on a white pine core."

The S. Hadley Lumber Company, Limited, Chatham, Ont., say:

"We are unable to give you any information from personal experience, as we have never made any doors from Norway pine, believing that it would not be satisfactory, and consequently we have never experimented with it."

W. C. Edwards & Company, Limited, Rockland, Ont., say:

"We never before heard of manufacturing doors from red pine. We use white pine altogether for doors, excepting where we use oak or some of the hardwoods."

Red Cypress Favored in the Southern States.

Among those who advocate red cypress for doors are the following:

The Standard Millwork Company, Norwood, Ohio, say:

"We cut up a considerable quantity of Louisiana red cypress every year in the manufacture of doors, sash and blinds. We make various other items in the millwork line of cypress. We make cypress as the nearest wood in all respects to the old Michigan and Wisconsin white pine, of any wood now in general use. It will hold its place and remains straight in doors. It will take a natural finish easily, and makes a fine finish. It will paint equally as well as any wood, and there is no doubt that it is more durable than any wood in use. Regarding the Southern yellow pine for millwork, we manufacture a great many doors from the short-leaf yellow pine. It makes an elegant door finish in the natural, is beautiful, has a fine grain, stands well, and is but a little heavier than cypress or white pine. Consumers who have used these yellow pine doors and are able to secure well manufactured doors, continue to use them."

The Louisiana Red Cypress Company, of New Orleans, La., say:

"We do not manufacture anything but Louisiana red cypress lumber, which is exceptionally well adapted to the manufacture of sash, doors and blinds. It is being used to-day where white pine was used in the past, and will make the very best doors on the market, not only on account of their durability, but because of the beautiful grain of the wood, and also on account of its character, as it does not warp."

The Huttig Sash & Door Company, St. Louis, Mo., say:

"We have been using cypress lumber largely for the past fifteen years and are using same more and more each year, which takes the place of the old Wisconsin white pine. The fact is, that during the last five years we have been using from four to six million feet of cypress lumber each year and believe that it is coming more and more into the general use."

The Baltimore Sash & Door Company, Baltimore, Md., say:

"We consider cypress one of the best substitutes there is for Northern pine. As to our method of treating the lumber, would say it may be treated in the same way as white pine. The main object is to have the lumber dry, and when it is properly dried it makes excellent material."

The large quantity of gravel required for the 1,300,000 cubic yards of concrete in the Keyham (England) dockyard construction was obtained at the Isle of Wight with two self-propelling sea-going hydraulic dredges of about 1,000 tons burden. The gravel was pumped to barges of 800 to 900 cubic yards capacity, and each dredge could fill a barge in an hour and a half in good weather. Five of these barges were in constant use, and were towed back and forth by sea-going tugs. On arrival at Keyham the gravel was unloaded by grab buckets slung from 10-ton travelling cranes, which ran on a 7-foot gauge track on the contractor's dock. These cranes were capable of unloading a 900-ton barge in about four hours.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the *Contract Record* may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

3. Brick.—A Belgian manufacturer of concrete brick for hollow walls (not hollow bricks), wishes to open up trade with a Canadian firm, or with a Canadian agent able to form a company to deal in such bricks within the Dominion.

8. Machinery.—A Lancashire firm wishes to correspond with Canadian manufacturers of concrete making machinery.

286. Agents.—A London firm manufacturing electric lifts, cranes and elevators, hydraulic lifts and cranes, and winding turbines for pumping and the production of electricity for lighting and power, wishes to get into touch with a Canadian engineering firm having representatives in the principal centres in the Dominion who might be open to handle their goods.

338. Iron, steel, metals.—A North of England firm desires to secure the buying agency of Canadian firms requiring iron, steel, metals, tools and other goods from time to time.

339. Spelter and zinc dross.—A Birmingham firm wishes to get into touch with firms of recognized good standing in Canada who may have hard spelter and zinc dross for disposal.

343. Building material.—A Manchester firm invites offers from Canadian manufacturers of doors and other building material.

359. Engineering materials.—A Manchester firm of engineers are in a position to undertake the purchase, inspection and shipping of engineering materials of all kinds, and would like to get into touch with Canadian railways, mines, factories or importing houses, wishing to utilize their services.

377. Agents.—Inquiry has been made by a London firm for the names of likely Canadian buyers of English hardware lines, mill stores, tinplates, turned sheets, iron and steel material, bricks, etc. The firm is prepared to appoint agents.

367. Paints.—A South African firm of wholesale merchants desire to communicate with Canadian manufacturers of paints.

Another Market for Canadian Cement

The Dominion Government Trade and Commerce reports contain the following from New Zealand:

"A Canadian newspaper states that a cement works in British Columbia is unable to find a market for its product if worked throughout the year. New Zealand should be a natural market for the cement produced in these works. As the result of a preferential duty of 2s. per barrel in favor of cement made in Canada as well as in Great Britain, nearly the whole of the importation comes from the United Kingdom. The importation in 1907 amounted to 223,037 barrels. The difficulty confronting the trade from Canada is the higher cost of production and the higher freight charged. It is possible that the facilities, which the British Columbia company has, may enable it to meet the cheaper labor conditions of other countries. As it is situated on tide water this, too, ought to facilitate a low rate of freight and it may be possible that, under the new arrangement of the steamship lines, freight sufficiently low can be had, to enable the company to get into the market and keep its establishment working all the year round.

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

A Small Septic Tank System for a Dwelling House

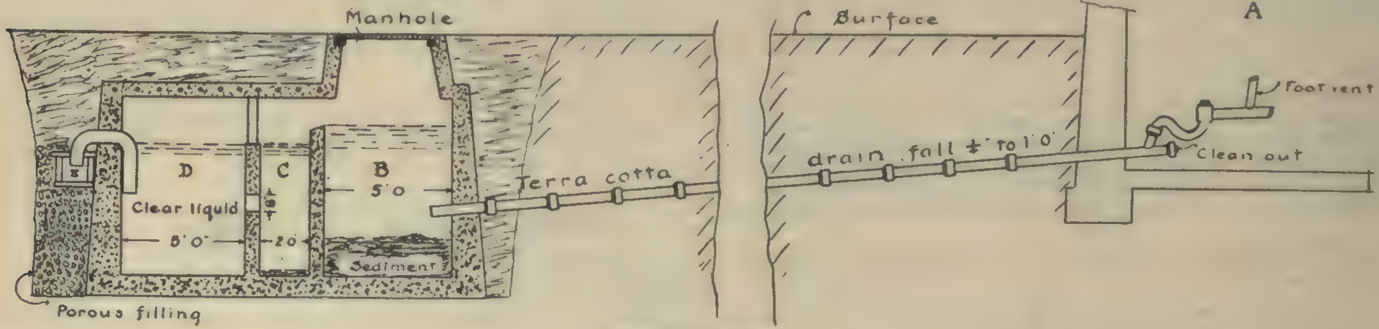
In regard to country houses and to scattered suburban houses out of the reach of city sewers it is profitable to know something of the construction of a small sewage disposal system by the septic tank method. Apropos of this subject a correspondent of the "American Carpenter and Builder," writes as follows:

"We have no sewage system in this village and I and also to ask if they are perfectly sanitary. The drain want to ask your advice in constructing a septic tank, from my cellar is a 6-inch tile and has a fall of not over 4 inches in 15 feet. I do not think the fall great enough to put in an ordinary closet."

In reply to this enquiry, Mr. T. B. Kidner, who is a recognized authority upon this matter, deplores the fact that so many country houses, tastefully designed and well built, are marred by primitive sanitary arrangements, and states that one of the best remedies is the installation of a septic tank system.

Continuing, this authority says that it is clear that for the ordinary dwelling house any system requiring frequent attention cannot beconsidered. In fact, it is a well known axiom with all sanitary engineers and manufacturers that sanitary appliances of all descriptions sould be as nearly as possible automatic in action.

There have been, however, numerous modifications of the septic tank idea designed with this in mind and to provide for single installations, based upon the principle of purification by means of the putrefactive germs or organisms contained in the sewage itself.

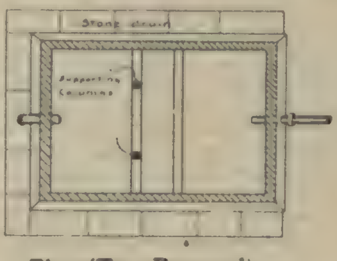


Sectional View

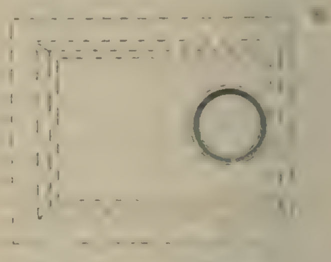
Our illustrations show such a plant, which was planned by a sanitary expert to provide for scattered suburban houses out of the reach of the city sewers.

A sectional elevation of the entire system is shown. At A is shown the usual arrangement for the piping inside the house wall, but it may be noted that the foot vent is not in its usual position on the top of the running trap In districts where excessive cold is experiencer it has been found the cold air is liable to descend through the vent pipe and freeze the water in the trap, and hence in the colder portions of the continent it is customary and advisable to place the foot vent some distance back from the trap so as to obviate the possibility of such an occurrence. The clean out must not be omitted, as an obstruction may occur in the terra cotta pipe, which is easily cleared by a rod operated through the clean-out hole. It is also important, in this connection, that the terra cotta pipe have a fairly good fall; certainly not less than ¼-inch to 1 foot, as indicated in the drawing.

B is the first chamber and receives the crude sewage, which enters at a point rather less than halfway from the bottom. The edge of the concrete wall or partition between this tank and the next one, C, is perfectly level from end to end, but is sloped off rapidly towards C to form a weir-like edge over which the liquid trickles in a very thin stream into the tank C. From C it passes as clear liquid through a hole half way up in the wall into the final tank, D, any slight sediment still remaining as it enters C from B being deposited in the tank C below the outlet.



Plan (Top Removed)



Plan Showing Manhole

From D the clear liquid flows out through a terra cotta invert, extending well down into the tank, into a stone drain, E, built with open joints. As will be seen from the plan, this drain extends round three sides of the whole structure, the liquid escaping from it into the mass of porous material which is packed into the excavation below the stone drain.

The manhole is placed over the first chamber to allow of the removal of the heavy sediment left there. For the ordinary household of five or six persons, a tank of the size shown would probably not require to be emptied oftener than once in two years.

After a good many years' use it would be advisable to excavate and renew the porous filling material under the stone drain, but the designer of the tank here shown estimates that in porous soils this would not be necessary oftener than at intervals of from ten to fifteen years. A better plan still, and a perfectly safe one, would be, if the lay of the land permitted, to lead the waste liquid from the final tank D into an open ditch or drain, or even into a brook or stream. No possible harm could result from this, which would be by far the best way of disposing of the liquid residue.

The construction of the concrete tank should not be difficult. It might be well to reinforce the top with ⅝-inch rods at about 9 inches centres and a concrete pillar or two from the top of the partition between the tanks C and D might be advisable.

The cost of constructing such a septic tank as is here described, or, to be more accurate, a cesspool with septic action, should not exceed $300 at the outside, and would be probably less in many localities.

Its position should be not less than 30 feet nor more than 100 feet from the dwelling house, although if the ground allows of a rapid fall for the drain so as to minimize the chance of an obstruction occurring in the long run of terra cotta piping, this maximum distance could be exceeded considerably.

In conclusion, many sanitary engineers have devised septic tank systems for individual dwelling houses and made regulations to meet the special needs of their localities, and where such exist builders would naturally be guided by them. But in the absence of expert advice, any builder of ordinary intelligence can construct a system which will meet all the requirements for the average dwelling house and be perfectly safe and sanitary if built on the lines indicated here.

Architecture and Illumination

In an address upon "Architecture and Illumination," at a recent convention of Illuminating Engineers, Mr. Emile G. Perrot said that illumination might be divided into two parts, necessary lighting and decorative lighting.

While these two divisions necessarily merge into each other, their relative importance depended upon the general character of the architectural treatment of the building. If the building was considered as a structure intended to serve the practical uses of man the illumination would be of the former type. If, however, architecture was considered in its real significence as being ornamental construction, one of the fine arts, and possessing in addition to its technical value, æsthetic and phonetic values—that is, beauty and power to tell a story—then illumination became only the handmaid of architecture, as were painting and sculpture.

Mr. Perrot believed that the architect should design the fixtures for a building just as he designed the carving for a column capital or the bas-relief enrichment of a frieze, for the use of stock patterns for any feature of a building was reprehensible. On the other hand nothing was more striking in a building than a lighting fixture when in use at night time.

The Singer Building in New York was referred to as a successful combination of architecture and illumination, while the illumination at the Pan-American Exposition of 1901 was given as an example of the utmost degree of harmony between illumination and exterior architectural effects.

In conclusion, Mr. Perrot referred to the necessity for the collection of data bearing on both the theoretical and practical sides of illumination for the use of those taking up the profession.

Plumbing for Water Service in the Home

The distribution of water service in the home is discussed in a recent article in "Shoppell's," which says in part:

All water pipes laid outside of a building should be so far below the surface of the ground that frost will not reach them, usually from three to four feet, according to the porosity of the soil, and the condition of the climate. It is prudent to have a stop cock box outside the building, so that the householder will be able to control the whole line, from the street line to the cellar, where another stop cock or wheel valve, with waste tube or opening, should be provided to allow of the emptying of all water pipes when the valve is closed. This waste opening is necessary to prevent any water remaining in the pipe from freezing in cold weather, and to allow the pipe to drain when repairs become necessary. The stop cock outside the building makes the householder independent in the control of his own water supply.

The service pipe should be laid with an even grade to the stop cocks, to enable the water to be properly drained when required. If any sags or depressions occur the water will lodge and cause trouble. The proper way to support a water pipe of lead in a building, is to fasten board with a "ground" under the pipe, and this will furnish a good support the entire length of the pipe. Pipe hooks, bands or tacks should never be used for supporting horizontal pipes of any kind, as the lead pipe will, of its own weight, sag between these supports, especially hot water pipes. The heating of the pipe will cause it to elongate, and it will never return to its original position.

The size of the pipe from the main to the building should be considered, taking into account frictional loss, distance run, and the needs of the building, to establish a perfect service. It should be ascertained just how high the water will rise, before plumbing work begins, because the system of piping, or the method of supplying and distributing the water best adapted for the building, will depend chiefly upon the height to which the water can be depended upon to rise. This height can be ascertained by applying a pressure gauge to the service pipe, and computing the vertical height of a column of water required to counterbalance the pressure indicated. It often happens that the water will rise and supply the top floors of a building during the night, but not during the day. This is due to larger quantities of water being drawn from the street mains during the day than during the night. When such a condition as this is encountered, a common house tank should be located above the highest fixture, large enough to hold a three days' supply.

Blowing off a Steam Boiler under Pressure

Oil and grease which accumulate in a boiler cause an unsteady water line, and are great preventives of the generation of steam. When they have accumulated in such quantity as to have this effect, the boiler should be blown off, under pressure, and the operation should be repeated as often as necessary, until the water is perfectly clean.

To blow the boiler off properly under pressure, the main valves at the boiler, or the radiator valves, must be closed. Then, by means of a wood fire a pressure of ten or twelve pounds should be generated. Then open the blow-off cock, using caution that the fire is only sufficient to keep up the pressure until all the water has left boiler. Draw the remaining fire, open all the doors, and allow the boiler to cool thoroughly before closing the blow-off valve and refilling. Then open all the main valves, or radiator valves, and start the fire.

Business Methods and Relationships of the Builder

An Interesting Review by Mr. J. H. Lauer, of Montreal, before the National Association of Builders

At the recent convention of the National Association of Builders, held in Ottawa, an interesting paper upon the above subject was read by Mr. J. H. Lauer, of Montreal, general secretary-treasurer of the association. Mr. Lauer's remarks were in part as follows:

The value of the interests involved in our business is so large as to demand an ability and an intelligence second to that required of no other business men, and we should avail ourselves of every possible source of information in the acquisition of a thorough knowledge of the best business methods. We should cultivate a high sense of business honor, and have full regard for the rights of our fellows. Let those of us who are less fortunate, less fully equipped, those who are not yet upon the high plane which they should occupy, receive assistance and encouragement from those more highly gifted.

It has been said by a great American—I do not give his exact words: There is a wise selfishness which prefers its own family, its own city, its own province, its own nation, to another's family, city, province or nation. Now, let us cultivate that kind of selfishness, and if we do not care more, let us do more for our own fellow craftsmen than for others. While urging our fraternity in the direction of higher and better business methods, let us insist upon the correction of some of the abuses from which we all suffer. In almost all contracts that are made, the builder, through the wording of the contract itself, or of the specification which is always a part of the contract, is made to occupy a subordinate and wholly inferior position.

One of the most level headed attorneys in this city said to me two years ago, in speaking of a certain contract, "It always makes me mad to read a contract such as builders sign."

This question of the character of the articles of agreement has been considered by this association, and may be said to be in a fair way of settlement upon a basis equitable and just, but the uniform form of contract has come into but partial use, due in a large measure to the fact that every builder feels that if he refuses to sign the agreement submitted for signature, there is a builder standing behind him who will sign, and so in absence of effective organization, the abuse containues and grows. It may be accepted as an aphorism that the man who submits to abuse invites abuse, and is certain, in the end, to be abused. In every business except ours a man who makes an agreement to do a certain thing has this thing specifically set forth, just that and nothing more. The thing to be done and the amount to be paid both limited, fixed.

Now, in the agreements which we make, the amount to be paid is fixed, the work to be done only partially so; both drawings and specifications are very frequently incomplete, but the owner is protected against loss on this account by some such phrase as this in the specification: "All work necessary to complete this building and which may not be specifically set forth herein shall be done under the direction of the architect without additional cost." Now, the builder who signs a contract with such a phrase as that above quoted in the specification agrees to do for a stipulated sum an amount of work limited only by the conscience of the architect. It is no answer whatever to this to say that the architect is usually fair and that he rarely takes advantage of his opportunity to damage the contractor. There is no reason in justice why he should have the opportunity to do so, and every reason why he should not.

In all this there is no intention of fixing any quarrel upon architects or of casting any imputation of bad faith or unfair dealing upon them. The architect, like the lawyer and other professional men, is zealous in the interests of his client, as he ought to be; he is, of course, always desirous that his work, both in design and execution, should be satisfactory to his employers, that he may be again employed, but above all is his zeal for his client's interest, the precise quality which entitles him to his client's confidence and commissions, and without which he could not honorably discharge his duties; but this zeal, however honest and honorable he may be, is the exact thing which disqualifies him for the position of arbiter between his principal and the other party to the contract.. Even if it could be shown that in no single instance since the world began had an architect been known to render a decision which was not grounded in absolute justice, still it would be unbusiness-like in one party to a contract involving the expenditure of money to place his interests at the disposal of an arbiter who was the paid agent of the other party to the contract. Who ever heard, except in the building business, of an arbitration in which the attorney or agent of one of the parties to the dispute acts as sole arbiter? The contracts as now written are inequitable for want of mutuality.

An Architect's Experience.

I recently noticed in a trade journal an address delivered before the class in architecture of the Department of Architecture of the Brooklyn Institute. I do not know, but presume that the lecturer was an architect. He was urging the young men of the class to strive to inform themselves upon the constructive part of their profession, and said:

"If an architect is deficient in the practical part of his profession, I defy him to be able to draw a correct specification properly explaining the whole of the work intended, and when a specification is deficient, the architect, in order to maintain his dignity and save himself, has been known to exact from the builder by some peculiar interpretation of his own, the work so omitted. Many a builder has been ruined in consequence, and by the architect also refusing to give proper compensation for extra work, thus withholding the certificate until the works were completed to the architect's satisfaction and to the contractor's ruination." Observe the arrangement of this passage; you will notice how closely the "ruination of the contractor" follows the "satisfaction of the architect," as effect follows cause. You will also notice that it is the architect, and not the builder, who makes the statement. I have never yet met the grade of architect to which the gentleman referred to by the lecturer belongs, but I am liable to meet him at any time.

There is no reason why any interpretation that is necessary should not be made before the price is fixed and the agreement signed. I know that the claim is made that it is impossible to foresee all points which may come up. If that is true, then leave those points to be taken care of by subsequent agreement, as is now done in some of the best offices. Why require the builder to draw upon his imagination and anticipate that which it is admitted cannot be foreseen?

It is our legal and just right to have the agreement limit the work to be done as rigidly and completely as the sum to be paid is limited. There is another matter in this connection to which I feel justified in calling your attention, and that is the subject of bonds of indemnity and a reservation of payment.

Bonds of Indemnity.

To illustrate: A builder agrees for five hundred thousand dollars to erect a building complete. He is required to give bond of indemnity for not less than one hundred thousand dollars conditioned that he shall complete the work in accordance with certain drawings and specifications which are to be interpreted by a gentleman who is the paid agent of the owner, and in addition to this bond there is reserved payment of not less than 15 per cent. of each of the partial payments provided for under the agreement, which reserved payment remains in the hands of the owner until the building is completed (usually thirty days after completion and acceptance). When the building has been carried to within twenty thousand dollars of completion and the builder has been paid according to agreement up to that time, the owner has in his possession seventy-two thousand dollars' worth of work which has been completed by the builder and not paid for, and his bond for one hundred thousand dollars to secure the completion of twenty thousand dollars' worth of work, and at the completion of the work and prior to acceptance the owner has ninety-two thousand dollars of the builder's money and a bond for one hundred thousand dollars.

In practice it seems to amount to just this: At the close of such a contract, supposing that the work has been completed in one year, the builder has given the owner a bond as above stated for the privilege of having the owner keep seventy-two thousand dollars of the builder's money for about seven months and of twenty thousand dollars for thirty days without interest. As a business proposition I think nothing could be more inequitable.

A Comparison.

In the ordinary business of life it is the man who owes the money who has to give the security. We have not yet reached ordinary methods. The absurdity of this arrangement is further shown by the fact that as the responsibility of the builder under the contract is diminished his guarantee is increased, and in the case supposed above the owner holds the same bond as at the beginning, plus ninety-two thousand dollars, while the builder's obligation has practically ended. What is the remedy? Is there any reason in justice or fairness why some such arrangement as this should not be made? When 25 per cent. of the money value of the building has been put in place and accepted by the owner, through his agent, the architect, they have a settlement and pay the reservation up to date. The owner's guarantee is not impaired, because he has the same bond for the completion of 75 per cent. of the work as he originally had for the entire building. Now let this be done at the completion of 50 per cent. and again at 75 per cent. of the work. Even under this arrangement the guarantee which the builder gives the owner increases as the builder's responsibility decreases.

These abuses to which I have referred are not of recent growth. They began at a time when the profession of architecture was not much regarded in this country, when its practitioners were, in the main, men of little education, most of them graduated from the carpenter's bench, the bricklayer's scaffold and the stonecutter's banker.

They were practical men with good practical knowledge, but they had no literary training and had acquired but little ability in the art of setting forth in specifications the requirements of their buildings, and in this way, I apprehend, arose the necessity for covering the defects in their drawings and specifications by some general requirement under which a builder who had contracted to build a church could be held to build a steeple also, though none had been shown or specified, because the church was to be complete, and no church is complete without a steeple. This system of making blanket clauses to cover all sorts of contingencies gave them great advantages, and the architects, like other men, will hold any advantage which custom gives them as long as they can. But they do not need this advantage now. The profession is now full of men thoroughly educated, trained designers and constructors, who know what their buildings require and how to impart that knowledge to the intelligent builder, and I can see no reason for the perpetuation of this old makeshift, the necessity for which passed away with the men who devised it. Therefore I think that an open and manly demand for the use of the uniform form of contract and the elimination of all ambiguity in specifications, all necessity for "interpretation," "peculiar" or otherwise, will be readily acknowledged by architects.

Excellent Conditions in the West

Reports from various parts of the West indicate excellent business. In this new country, the activity or dulness of the building trades is looked upon as one of the best gauges of general business. Measured by this standard, the year 1909 has started out for a record. The building permits in Winnipeg for March fixed the value of the buildings to be erected at $851,700, a sum which exceeds the total for any preceding March. In 1906, the year in which Winnipeg's new buildings reached the total cost of $12,500,000, the total of the permits issued in March was a little over $782,000, and in March, 1907, it was $703,000. From the beginning of the present year to the end of March the total is well up to the total of the first three months of 1906, and the indications are that the total for April will be of exceptionally large proportions since it will include permits for some of the largest new structures of this year, including blocks and additions to business establishments.

Cofferdams filled by a hydraulic dredge have been used in work near Lake Champlain, and have been found to be perfectly tight. The cofferdams were constructed in the usual manner, and were sheeted on both sides. The discharge pipe from the dredge was turned into them and the water allowed to escape by overflowing the top, leaving the discharged material in the enclosure. Clay was used as a general rule, but no effort was made to secure it, the material as occurring where the dredge happened to be located being found satisfactory. These cofferdams have withstood heads of about 20 feet during a considerable part of the last construction season.

A surveyors' preliminary report to the Canadian Government states that the projected railway to Hudson Bay could easily be built either to Fort Churchill or Port Nelson at a cost, including terminals and harbor work, of about $17,500,000. The report also says that a canal could be built along the Nelson River, which would enable ocean-going vessels to enter Lake Winnipeg from Hudson Bay.

Improvement in Manufacture of Paving Brick

Economy and other Points in Favor of Wire-Cut Brick—The Dunn Cutting Device

A device which the inventor, Frank B. Dunn, of Conneaut, Ohio, feels confident is going to prove of great value to the paving brick industry, has been perfected and is now offered to manufacturers of high-grade paving brick on a royalty basis. The merit of the improvement is so obvious, according to the "Clay Worker," the source of our information, that it is simply a case of "seeing is believing."

The invention is the result of years of study and experiment in actual brickyard practice Though yet a young man, Mr. Dunn has had more than eighteen years of actual experience in the clayworking industry; first as workman and then as foreman, and afterwards as superintendent of a fire-brick plant. Subsequently as machinist, erecting mechanic, salesman and accountant in a factory where clayworking machinery was manufactured, and finally for the past seven years as president and general manager of a paving and building brick plant, and, incidentally, a street paving contractor as well, Mr. Dunn has certainly had abundant opportunity of acquiring practical knowledge of every detail of the business, and this new device shows that he has brought his inventive faculties to bear in a very practical way.

It falls to the lot of few men to have such a wide and thorough training in any one line of business, but such an experience enables one to observe the defects and failures, and to devise practical means of overcoming them. This latest invention is not the first upon which Mr. Dunn has been allowed patents, but we believe it is by far the most important. He has always been alert to the possibilities of improvements in the methods of manufacture and use of brick, as well as to the office end of the brick business, he having devised a thorough, practical and concise cost system which he has used to excellent advantage in his own business, and which he has promised to publish for the benefit of his fellow-manufacturers in the near future.

We might also mention that in 1903, realizing the untold harm being done the interests of brick as a paving material, by each and every individual manufacturer trying to convince the public that his was the only brick fit for use, Mr. Dunn undertook to organize a company to buy up all the plants capable of manufacturing a No. 1 paving brick, and succeeded in obtaining bona fide options providing for the possible purchase of plants producing more than 90 per cent. of the total output east of the Mississippi River,, including, without exception, all the important plants independent of the asphalt interests. It will be remembered that about that time there was a general slump in the stock market, and as the purchase prices of the properties desired called for about $10,000,000 capital, the proposition was wisely abandoned. However, during these negotiations prominent men were brought closer together, and, realizing the importance of concerted action to educate the public to the great advantages of brick in general over many other paving materials, the National Association of Paving Brick Manufacturers was soon organized. The good this organization has accomplished for its members, as well as for the public, has been beyond all expectations. although full credit must be given the skilful management of the association and the cordial support of each and every member.

The Dunn Cutting Device.

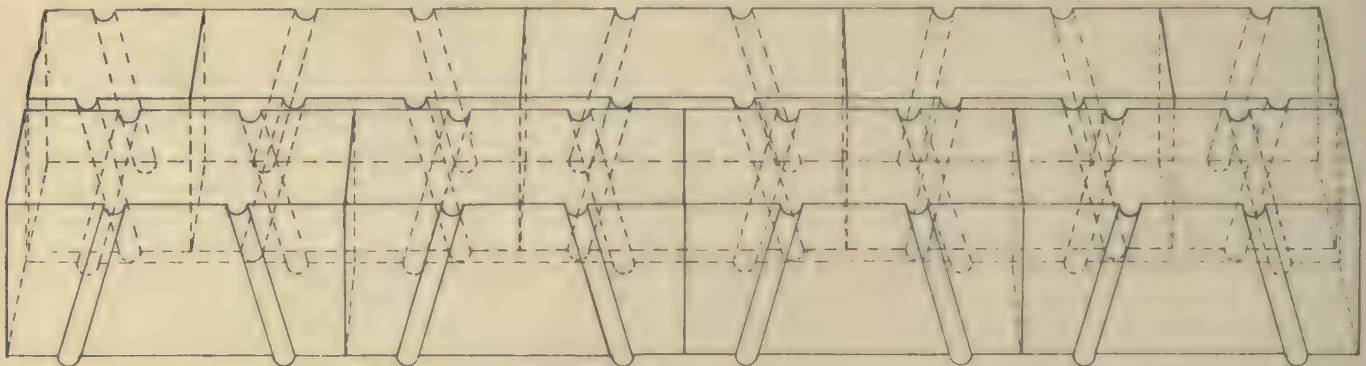


Fig. 1.

Mr. Dunn's latest invention consists of guides, either rigid or in the form of rolls, attached to the platen of the cutting table above and below the column of clay, and projecting over the line of travel of each wire as it passes through the clay column, thus deflecting the wire slightly and forming a rib or lug across the face, or rather the side of a side-cut brick. This also makes a corresponding groove in the adjoining brick, but the groove can be easily removed by attaching extra wires to cut off sufficient clay, which will immediately return to the auger machine over the waste clay conveyor. The groove, however, is not considered injurious to the brick and may be left on, thus avoiding any waste of clay.

It will readily be seen that the size, shape, position and number of ribs made on each brick are governed by the guides or deflectors, the shape and position and the style of cutting table used, but ribs or lugs may be cut on any cutting table made. The position of lugs cut on a reel cutter depends entirely upon the location of the centre of the reel in relation to the clay column. By placing the deflectors on opposite sides of the column, so that the wire will strike them in unison, a rib is formed which is uniform in thickness at both edges of the brick, but usually less towards the centre, owing to the fact that the wire is flexible, and, being attached to tension springs, drags back towards the centre of the column. Consequently the wire has passed over the deflectors, and has returned to its normal position before it has been deflected the full depth of the rib in the centre of the brick.

Removing the springs and making the wire taut would make the rib uniform its entire length, but we believe this should not be, as the thinner lug in the centre of the brick will permit filler to pass through at this point and make a better bond.

If ribs of certain thicknesses at one side of the brick and tempered to naught at opposite edges are desired, one deflector only is adjusted accordingly.

We show herewith several designs which give some idea of the different ribs or lugs that may be made on any wire-cut brick. Fig. 2 shows a brick made on a horizontal cutter, which is a cutter with horizontal movement and vertical wires. These ribs are placed nearer the ends than the middle, in order that when the brick is laid in the pavement with joints broken the ribs will not fit into the grooves in the adjoining brick, but will hold the brick apart as intended. Fig. 4 shows brick made on the same cutter, but with ribs so located midway between the ends and middle of the brick that when laid with joints broken the ribs will fit into the grooves in the adjoining brick, thus making an interlocking brick for use where no filler is desired. This brick is better adapted for sidewalks, private driveways and country roads, where the cost of filler is prohibitive, and, at the same time, a lighter or no curb is required, as the brick, being interlocked, cannot spread. Fig. 3 shows brick made on a cutter with the centre of the reel directly over the centre of the column, thus making the ribs at opposite angles. This will in all probability be preferred, as will be seen by referring to fig. 1, wherein two rows of these brick are shown as laid in the pavement with points broken. In this manner the ribs on each brick cross the grooves in the adjoining brick, and as the grooves will naturally fill with cement or other filler the same as the space between the brick, a bond can thus be obtained which it will be impossible to disturb except by breaking the brick. Fig. 5 shows a brick made on a cutter wherein the centre of a reel is about 12 inches above the clay column, and about 8 inches to one side of same, or such as can be made on a Freese standard cutter.

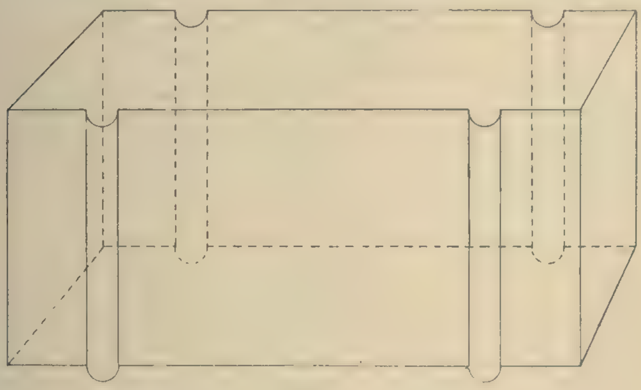


Fig. 2.

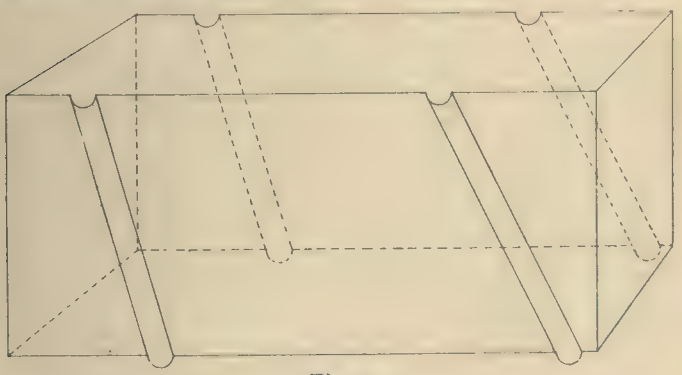


Fig. 3.

As stated before, we have in the wire-cut brick with wire-cut lugs all the advantages of the repressed brick, with none of the disadvantages.

In making either wire-cut repressed brick, the clay or shale is first mixed with water to such a consistency that when it has passed through the auger machine, emerged from the die under such intense pressure as can only be obtained by the auger shaft, which is in reality a screw propeller, and has passed over the measuring belt and been cut into brick on the cutting table, it can be picked up by the off-bearer without being marred in handling, or in being piled from three to six courses high on cars ready for the dryer. To repress them, they are, in this condition, fed into a two-mould press, the mould boxes of which must be from one-eighth to three-eighths inch longer and wider than the brick to allow the brick to drop in freely, and to provide for any slight variation in size of the wire-cut brick caused by the variation in the consistency of the clay-column. The plunger then descends into the mould and presses downward on the broad side of the brick.

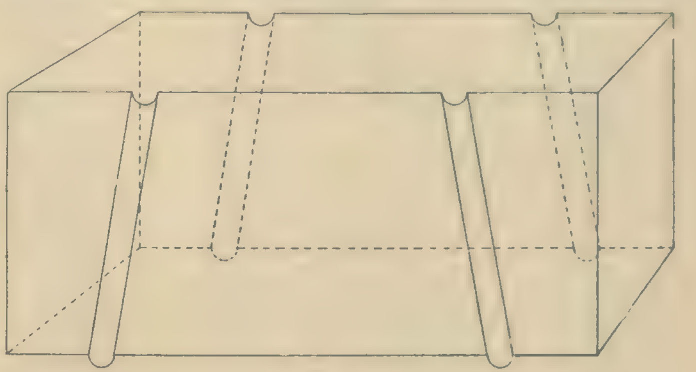


Fig. 4.

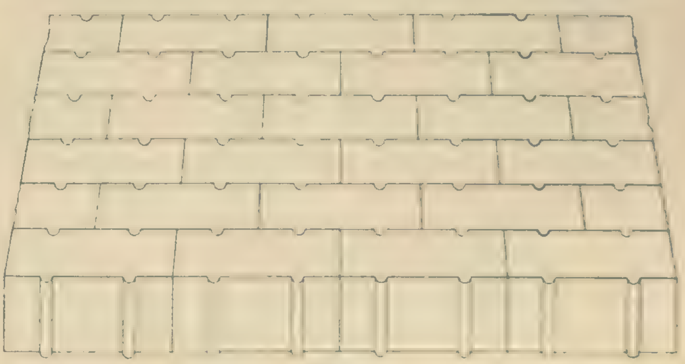


Fig. 5.

First, the original formation of the wire-cut brick is no longer maintained, but is broken up and spread sufficiently to fill the mould in length and width. Then, if there is sufficient clay in the brick it will fill up any letters, lugs or other design which the pressure plate bears, whether they are in convex or concave form. If there is not sufficient clay in the mould or the clay is too stiff the letters or lugs will not fill up, and this latter not unusual condition accounts for the non-uniformity in depths of lugs on the average repressed brick.

It is an open question whether there is a repress on the market with sufficient power to make a brick out of clay that has not previously been formed into brick. It is not therefore to be expected that a repress can disturb the original formation of the wire-cut brick, break it up and remake it into a perfect brick, and especially when the clay is stiff enough to be handled without marring, to say nothing of being piled six courses high.

As evidence of this fact, we all remember the account published a few months ago in all the daily papers and trade journals, wherein it was stated with authority that a toad had been imbedded in a brick and put through a dry press machine and came out unharmed, and, be it remembered, that a dry press is a powerful, massive machine, designed to make a first-class brick out of dry pulverized clay, and has many times more power than a repress. No one could imagine a toad withstanding the pressure of an auger machine, even though it did not come in contact with the knives or auger.

Round edges, which can only be put on side-cut wire-cut brick by repressing, are of no value whatever except that each manufacturer of repressed brick prefers the larger radius possible on the edges and corners of his brick where it is to be tested for abrasion in competition with other repressed brick. If all compressed brick were of the same size and same square edges, abrasion tests would be of more value in comparing quality.

In a recent conversation with one of the prominent paving brick manufacturers, when he was asked the reason for round-edged bricks, he jokingly replied that years ago square-edged brick were used, and that with poor filler or no filler at all the edges were exposed and were soon rounded off by the calks on horses' shoes. Some one suggested repressing the edges round, and every manufacturer has adopted the suggestion. Note the consistency in such philosophy, when we are trying to make the smoothest street possible, and when we have cement fillers which will protect the edges of the brick.

One of the largest paving brick manufacturers recently said that a wire-cut brick put through a repress gained 3½ cubic inches, showing that the clay was not as dense after being repressed as before. He also said that wire-cut brick stood 4 per cent. less loss in an abrasion test than did the repressed brick, and that at least a half dozen other manufacturers of paving brick had agreed with him that they had not made as tough brick since repressing as they did before. If wire-cut brick wall stand 4 per cent. less loss in an abrasion test they are one-third better, as a No. 1 repressed block will only lose about 16 per cent. in a standard test.

Furthermore, it is generally known that the manufacturer has a much greater percentage of loss in seconds and culls in repressing brick in addition to the actual cost of operating the press.

Now, therefore, in the wire-cut brick with wire-cut lugs, we have a paving block with square edges, uniform thickness of lugs, a wire-cut surface on the broad sides of the brick, to which filler will adhere more firmly, and, in all, a perfect brick for paving purposes, which means a smooth pavement with bricks or blocks uniformly bonded together, and a cheaper, though more durable, pavement than has been possible heretofore.

Mr. Dunn has made a quantity of these brick, and his statements are therefore not based on theory, but upon actual results. He now proposes to enter into contracts with manufacturers who have suitable material for making a No. 1 paving brick, and license them to manufacture these brick on a royalty basis.

He is not only protected by patents on the method of deflecting the wires on the cutting table, but also upon the finished brick, and is fully protected on any brick having a wire-cut lug or rib.

The Effect of Air and Moisture Upon Steel Reinforcement

The increased use of reinforced concrete in every description of constructional work lends interest to a series of tests which have just been carried out in Germany with a view to ascertaining whether air and moisture entering through the ordinary tension cracks that cannot be avoided will cause rusting of the steel reinforcement. The results tend to show that when the steel reinforcement has not been stressed to beyond its elastic limit the cracks formed in the concrete are insufficient to cause rusting. For carrying out the tests, beams 6 feet 3 inches by 8 feet 6 inches in cross-section and about 59 inches long, with the various kinds of reinforcement in general use, were prepared. In each case the steel was situated 1¼ inches above the bottom of the beams and formed from 1.08 to 1.81 per cent. of the area above the centre line of the steel. The concrete was mixed in 1 : 2 : 4 ratio, and 10.1 per cent. of water was added. It was found that this amount was sufficient to give a quite plastic mass. The forms were not removed until 24 hours had elapsed. For three months the beams were then stored, some in the open air and some in wet sand, and water was sprinkled over them every day. During the next three months load tests were made on the beams with a view to finding the various physical properties of reinforced concrete beams—viz., first point of cracking, stress in concrete, stress in steel and ultimate strength. Of the total of 58 beams made, 26 were broken during the tests. The remaining beams underwent a rapid rusting test under load, which was usually about the same as that to which the beam had been previously subjected. This load varied from considerably below up to the elastic limit. The gear consisted of levers for applying a fixed load to the beam at two points, and a mixture of carbon dioxide, oxygen and water vapor was passed through a sheet iron casing fixed round the middle third of the beam. In the greater number of cases the beams were kept in the rusting atmosphere from 7 a.m. to 4 p.m. for three consecutive days. The concrete below the steel was then chipped off, and the steel examined. In 27 cases no rusting at all was observed. All these beams had been subjected to loads causing stresses in the steel varying from 18,000 pounds to 35,000 pounds per square inch. Where the steel had been stressed from 35,000 pounds to 44,000 pounds, rusting was found to have taken place. The cement makers state that the composition of the cement used in the test was as follows: Silica, 21.86 per cent.; alumina and iron oxide, 10.8 per cent.; lime, 62.5 per cent.; magnesia, 1.67 per cent.; sulphuric acid, 1.69 per cent. On ignition it was found to lose 1.82 per cent., and the specific gravity was 311.45.

A man once spyoke with a sneer about his employer. He lost his job—not only because he sneered, but because he was out of tune with his work. He has always lost his job. He always will—until he learns loyalty. For wherever there is lack of loyalty there is no enthusiasm, and without enthusiasm there is no force in work.

Did you resolve to build a house this season for yourself and family? If not, make a hardened steel resolution to do so, and get your wife to second it, and the children to carry it, without delay, and you will not find it so difficult a job as you imagined after you once get started.

Power Plants, Electricity and Telephones

(Continued from page 24)

information address S. G. McClenahan.

The Merchants' Light & Power Company have applied to the Dominion Legislature for a charter to supply electricity and gas within a specified territory in Montreal for lamps and motors. The company is to be capitalized at $1,500,000 with power to increase it to $3,000,000. The petitioners for incorporation are: Odilion Lemire, J. B. Letendre, B. Mercier, A. T. Vallieres, O. Lecompte, L. J. Tarte, J. Durand, R. A. Brossard and others.

Oxbow, Sask.
The Oxbow Telephone & Lighting Company have decided to build rural lines to Auburton, Arthur, Boscurvis and Glen Ewen. For further information, address J. P. Tripp.

Prince Albert, Sask.
On the advice of Mr. C. H. Mitchell, consulting engineer, Toronto, the council will proceed with the development of a $1,000,000 hydro-electric plant on the Saskatchewan river.

Stamford, Ont.
The township council are considering the question of extending the electric street lighting system to Lundy's Lane, Falls View and other side streets in the town. The Ontario Distributing Company have agreed to extend their transmission lines if they can secure contracts to place 800 lamps in residences in that section of the town. A committee has been appointed to make arrangements to secure the service.

Stellarton, N.S.
The Edgerton Tramway Company, Limited, are reported to have purchased the power plant of the New Glasgow Electric Company, Limited. It is proposed to move the plant from New Glasgow to the former company's buildings at Stellarton. It is probable that considerable new equipment will be installed. Alvin McDaniel is the Chief Engineer.

Wascana, Sask.
Steps are being taken to organize a telephone company, which will be known as the Wascana Rural Telephone Company.

Winnipeg, Man.
The sum of $750,000 was voted by the legislature for telephone work during the year, and the plan of the commissioners is to expend it as follows: Winnipeg underground and aerial work, $160,000; Fort Rouge exchange and switchboard, $75,000; West Winnipeg exchange, $35,000; rural and farmers' lines, $270,000. Opening new exchanges and increasing eqquipment in present exchanges and making alterations, $104,000. Extension of long distance lines, including wires on existing poles in the province, $106,000. It is estimated that of this amount, $300,000 will be for labor and $450,000 for material. All work will be done by day labor, under the supervision of the commissioners.

AWARDED.

Calgary, Alta.
The contract for the motor generator and switchboard of the Calgary power house was awarded to Allis-Chalmers-Bullock Company, of Montreal, at $15,950.

The following tenders were submitted to the Water & Light Committee for two electric turbo pumps: Canadian Crocker Wheeler Company, Montreal, Que., f.o.b. Moncton, $3,660; Goulds Manufacturing Company, Syracuse, N.Y., f.o.b. Moncton, $4,200; R. H. Buchanan, Montreal, Que., f.o.b. Moncton, $3,993; Canadian Buffalo Forge Company, Montreal, Que., f.o.b. Montreal, $3,180; Peacock Bros., agent English firm, f.o.b. Montreal, $3,435; Canadian Fairbanks Company, Montreal, Que., f.o.b. Montreal, $4,768; Canada Iron & Foundry Company, Toronto, f.o.b. Moncton, $4,127; Canada Iron & Foundry Company, Toronto, Ont., erected, $4,500; Drummond McCall Company, Montreal, erected, $5,789.40; The John McDougall Caledonian Iron Works Company, Montreal, erected, $5,440. The contract was awarded to the Canada Foundry Company.

Montreal, Que.
Laurie & Lamb, engineers, this city, advise us that they have placed with Belliss & Morcom, of Birmingham, England, an order for two 150 kw. Belliss engines for installation at McGill University for their power plant. These engines will be direct connected to generators. They are of the two-crank compound type, with a special expansion gear fitted so as to care for overloads, and still maintain economy of steam consumption.

Nelson, B.C.
The Allis-Chalmers-Bullock Company have the contract for putting in the turbine and generator at the city power plant to complete the second unit at Bonnington Falls. Estimated cost, $75,000.

Toronto, Ont.
The Toronto and York Radial Railway Company have awarded to the Philadelphia Railway Company a contract for eight new cars to cost $6,000 each.

Laurie & Lamb, Montreal, Canadian agents for Belliss & Morcom, Birmingham, England, have recently received an order from Toronto University for a Belliss engine for use in the hydraulic laboratory. This engine will operate a couple of centrifugal pumps by belt.

Windsor, Ont.
The City of Windsor have awarded to E. Leonard & Sons, of London, Ont., the contract for the steel boiler and engine required for their electric light works. The following is a list of the tenders submitted: E. Leonard & Sons, London, Ont., steel boiler, $1,090; 250-horse power Cross Compound engine, $3,250. John Inglis & Company, Toronto, boiler $1,425. W. J. Bradley, boiler, $1,650. Clinton Engine Company, boiler, $1,750. Waterous Engine Company, Brantford, boiler, $1.087; engine, $3,477. Polson Iron Company, Limited, Toronto, boiler, $1,825. Canada Foundry Company, Limited, Toronto, boiler, $1,460. Robb Engine Company, Amherst, N.S., boiler, $1,340; engine, $3,098. Goldie & McCulloch, Galt, Ont., boiler, $1,137; engine, $3,345.

Miscellaneous

Cobalt, Ont.
The Town Council will probably expend a considerable sum upon necessary fire-fighting apparatus.

Glace Bay, N.S.
The Town Council have decided to borrow several sums of money for additional school accommodation, water service improvements, and street work to the amount of $30,700. The several amounts are as follows: New school building at Stirling, and extensions, $6,500; repairs to town reservoir, and water extensions, $20,000; street repairs, $4,200. The necessary authority will be asked for at this session of the Legislature.

Hamilton, Ont.
The city will issue debentures for $237,000 for permanent improvements.

Medicine Hat, Alta.
The Old Glory gas well has developed a daily output of 8,353,000 cubic feet, capable of developing 3,800 horse power. The gas is now being used by the C. P. R. to pump water to Bow Island station, five miles away, and it will also be piped across to Suffield, on the main line, to be used for the same purpose there.

The tenders for the construction of the huge irrigation ditch of the Southern Alberta Land Company, near Medicine Hat, were recently opened. It is understood that the figures of J. D. McArthur are the lowest. This piece of work is one of the heaviest of its kind ever undertaken in Canada. The contract calls for the construction of forty-five miles of ditch to carry water for the irrigation of 400,000 acres of land.

Moose Jaw, Sask.
Four money bylaws are before the ratepayers and will be voted on April 26th. These bylaws provide for the raising of debentures of over $100,000 for the following purposes: $42,000 for the completion of the collegiate, $30,000 for the sinking of a test well, $17,000 for the purchase and fitting up of the exhibition grounds, and $20,500 for the building of sidewalks.

Saskatoon, Sask.
Tenders addressed to J. H. Trusdale, City Clerk, will be received until April 28th for the following works: (a) One brick, steel or concrete smoke stack, with a height of 100 feet and inside diameter of 66 inches, together with corresponding smoke connection to boilers; (b) bricking in two 250 horse power Robb-Mumford water tube boilers. Plans and specifications may be seen at the office of the Electrical Superintendent.

AWARDED.

Dutton, Ont.
James A. Bell, township engineer, has awarded the contract for digging the Douglas drain to Wm. Stidwell, of Dutton, and Thomas Everiste, of Wallacetown.

Haileybury, Ont.
$5,000 five per cent. 10-year debentures, issued for the erection of a fire hall, have been awarded to G. A. Stimson & Company, Toronto.

Victoria, B.C.
The City Council has awarded a contract for 55 gate valves to Prior & Company, of Victoria, as follows: 15 12-inch, $44.15 each; 20 8-inch, $19.41 each; 20 6 inch, $10.63 each. For rough lumber, J. A. Sayward, Victoria, $10 per 1,000 feet; for paving blocks, J. A. Sayward, 3 x 8 x 3 1-2, $8.75 per thousand; 3 x 8 x 4, $10 per thousand; 3 x 8 x 5, $12.50 per thousand.

P. Leroux & Bros., stone cutters, St. Vincent, Que., have dissolved partnership.

The Ritchie Contractors' Supply Company, Quebec, Que., has registered.

Lynch & Sharpe, general contractors, Montreal, Que., have registered.

The Merrick Foundry Supply Company, Toronto, Ont., are reported to have assigned to E. R. C. Clarkson.

A winding-up order has been granted in connection with the Weller Sills Company, Limited, lumber manufacturers, Colborne, Ont. Mr. E. R. C. Clarkson has been appointed provisional liquidator.

Novel Bridge Construction

The erection of a railroad bridge of 140-foot span over the King river in Western Tasmania was done by constructing it on shore parallel with the stream, then rotating it until parallel to its intended position, and finally launching it across the stream. This was done because the river was too deep for a pile foundation for the falsework, and because no other suitable strip of land was available for erection. When the riveting was completed the bridge was placed on rollers, and after being swung around over the abutment was raised by a tower erected on a scow. The latter could not be located far enough from the end and therefore on reaching the other abutment, on account of the skew and the shelving bank, could place the bridge just sufficiently to give bearing. Later it was pushed forward with hydraulic jacks and then moved transversely to its final line, on which it would have been launched but for buildings which interfered.

A Canadian Customs ruling has been announced under which boiler plate, flange plate and fire-box plate not less than 30 inches in width and not less than one-quarter of an inch in thickness, imported for use exclusively in the manufacture of boilers may be entered at Customs without the "dumping" clause being applied thereto.

Recent developments show that, after all, there was something in that "Build Now" campaign. Augmented proofs will follow. Therefore, back to the old argument and get busy.

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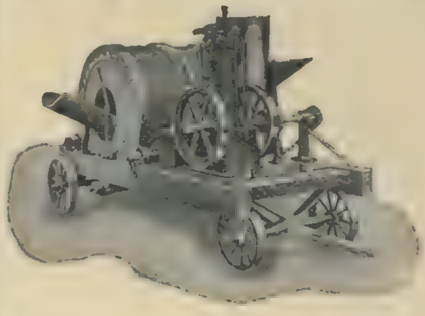

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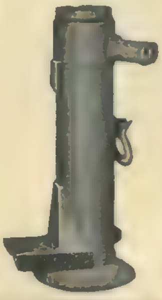

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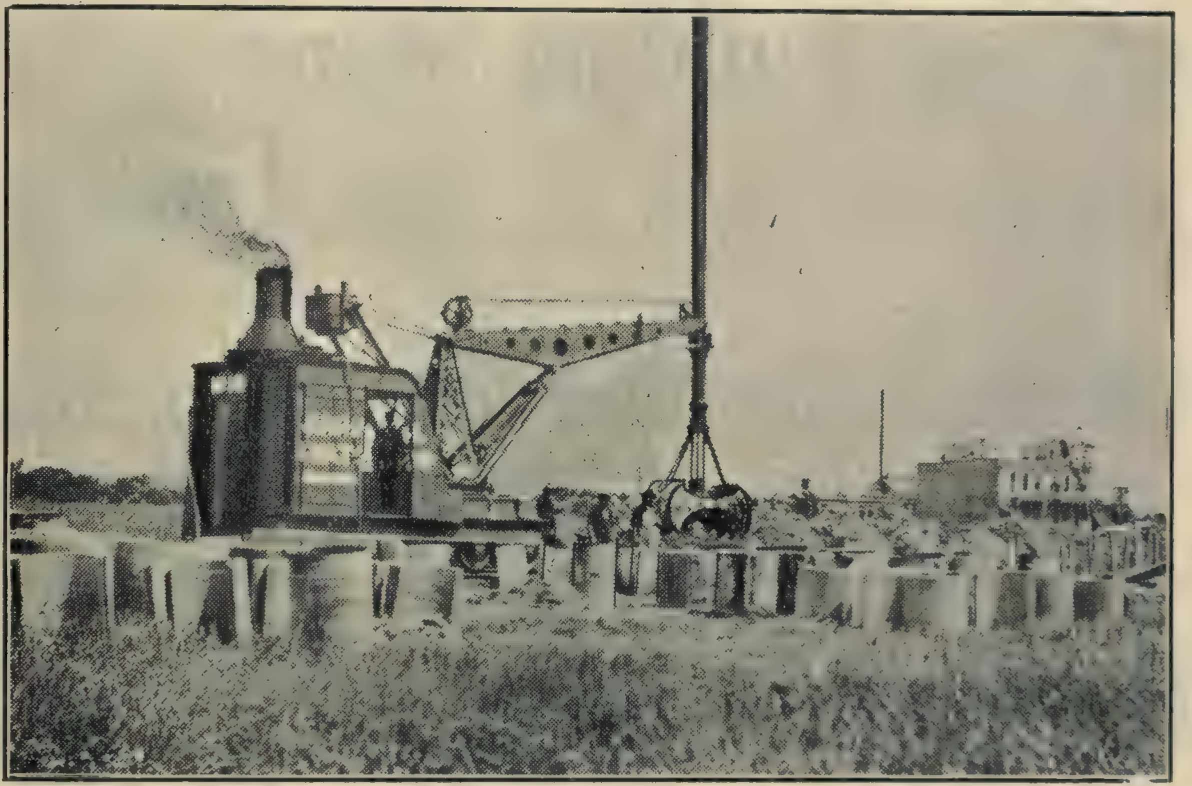

This machine will excavate to any depth down to 25 ft. and dump the earth right into the carts, the operation does not take a minute.

The only difficulty experienced is, that carts cannot be furnished quick enough to keep the Machine going.

These Machines are adapted for deep excavations for large buildings, railway construction, sewerage work and other work of that description and will be great money makers for Contractors, as one Machine will do the work of at least fifty (50) men.

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Aylmer, Ont.

Debentures amounting to $14,000, issued for sewerage purposes, have been sold to G. A. Stimson & Company, of Toronto. $6,000 debentures for local improvements have been sold to the same firm.

Brockville, Ont.

At a meeting of the Town Council last week a letter was read from Mr. T. M. Kirkwood, of Toronto, asking the council to agree to guarantee the interest on the bonds of a company for twenty years to an amount of $25,000 per mile for an electric railway from Toronto to Montreal. It was pointed out that the company was not asking for a bonus in money. The council took no action.

Brandon, Man.

A recommendation has been passed that a bylaw be submitted to the Council authorizing the issue of debentures for the construction of a trunk sewer.

Brodhagen, Ont.

Tenders addressed to Frances Jacob, Township Clerk, will be received until April 26th for repair of the McNaught drain in the Township of Logan. Plans on application at Mr. Jacob's office at this place.

Estevan, Sask.

The ratepayers have approved by-laws to raise $30,000 for a water works system and $10,000 for a trunk sewer.

Tenders addressed to L. A. Duncan, Secretary-Treasurer, will be received until May 19th for construction of a water works system and main sewer, comprising 7,300 feet of water mains, 2,400 feet of tile sewer, also steel water tower, gasoline engines and power pump. Plans and specifications at office of Secretary-Treasurer, this town, or at office of chief engineer, Mr. Willis Chipman, 103 Bay street, Toronto.

Edmonton, Alta.

The City Council have authorized the bitulithic paving of 38,896 square yards of city streets at an estimated cost of $166,688.

Hamilton, Ont.

The Sewer Commission has decided to construct sewers in the annex on Chase, Emily and Clinton street, at a cost of $16,000; also a sewer on Hunt street.

New Liskeard, Ont.

Tenders addressed to F. W. Ferguson, Secretary Treasurer Water Commissioners, will be received until May 1st for waterworks connections, etc.

Orillia, Ont.

The ratepayers will probably be asked to vote on a by-law to raise funds to provide for a sewerage system in the business section of the town.

Ottawa, Ont.

City Engineer Ker will prepare plans for the drainage of the western end of Hintonburg. The cost has been roughly estimated at $100,000.

Prince Albert, Sask.

The City Council, at a recent meeting, passed estimates for $50,000 to provide for paving all the business streets.

Toronto, Ont.

The City Engineer has recommended the construction of water mains on the following streets: Dunvegan road, Shaw street, Castle Frank crescent, Duggan avenue, Gormally avenue, Roxborough street east, Russell Hill road, and Constance street.

The plans and specifications for the city water filtration plant have been completed, and tenders will be advertised for within the next few days.

The City Engineer has recommended that sewers be constructed on the following streets: Globe avenue, $1,190; Bridgman avenue, $1,440; Howland avenue, $2,110; Hunter street, $540; Sparkhall avenue, $1,060.

Tenders addressed to L. O. David, City Clerk, will be received until April 21st for the delivery of sundry machinery and macadamizing stone, required by the roads department. Tender forms and all information supplied on application at the City Hall.

Walkerville, Ont.

At a recent meeting of the town council, Town Engineer McKay reported upon the proposed new trunk sewer, estimated to cost $27,000.

Westmount, Que.

Tenders addressed to A. D. Shibley, City Clerk, will be received until April 22nd for supply of vitrified sewer pipe, farm tile, gravel, sand and paving brick.

Winnipeg, Man.

The city will undertake work of local improvement on Princess street, from the city park easterly to Chambers street. The street will be graded, macadamized and drained and permanent sidewalks will be laid on both sides.

The Controllers have placed the laying of a water main on Jessie avenue on the order paper for immediate construction.

The Board of Control want tenders for the following asphalt pavements: Osborne street, Osborne bridge to Stradbrooks place; Bell avenue, Main street, to Wood street; Donald street, Graham avenue to Portage avenue; Dundurn place, Maryland to west end of street and from west end of Dundurn place to Walnut; Rorie street, south line of transfer track to Bannatyne avenue; Victoria street, Lombard to Notre Dame avenue; Rachel avenue, Sutherland avenue to Higgins avenue; Martha street, Henry avenue to Alexander avenu; Salter street, Selkirk avenue to Redwood avenue; Scotia street, Cathedral to North city limits; Stadacona and Levis, Louise bridge to north line of Nairn; Nairn avenue, Stadacona street to Roland avenue. The tenders for the work passed are returnable on May 20.

Yellowgrass, Sask.

The ratepayers have carried a by-law to raise $20,000 for a system of water works.

AWARDED.

Hamilton, Ont.

Wood-Vallance & Company have secured the contract from the city for supplying 800 feet of six inch wrought iron pipe for the connection between the city sewer and that on the mountain.

Montreal, Que.

Contracts were recently awarded by the Roads Committee of the City Council for the supply of asphalt, flagstones for sidewalks, and other material required this season. No decision was reached regarding the supply of paving blocks. As regards asphalt pavement, it was found that the Sicily Asphalt Company and the Barber Paving Company were close together in prices. The Sicily Company, at $2.29 for ordinary Bermudez asphalt, was the lowest, and when streets are to be paved from curb to curb with asphalt that tender will be used. The price for the same asphalt offered by the Barber Company was $2.37. The tender price of the Barber Company for block-stones was $2.02 a square yard, and that of the Sicily Company $2.06. Both companies tendered for asphalt laid on six inches of concrete as well as on nine inches and on twelve inches. It was thought advisable to accept both tenders of these companies. For the supply of scoria blocks, the firm of F. D. Lawrence was granted the contract. Their price for bricks of ordinary size was $45.95 a thousand. This firm, in fact, was the only tenderer. Hyde & Webster asked $45.50 a thousand; W. McNally & Company offered the same bricks for $42.25; and the Sicily Company at $41.70. The matter was left in abeyance. The Laurentian Granite Company wanted $1.79 a square yard for ordinary blocks, which the Sicily Company offered to the city at $1.43. The latter company offered three kinds of blocks at the same figure. The committee were practically agreed that they wanted Laurentian blocks, but in view of the difficulty it was resolved to leave the matter over. For ordinary blue stone flags F. D. Lawrence was the lowest at $1.65. The next was that of Laurin & Leitch, at $1.69. The lowest tender for Danforth stone was La Compagnie de Construction et de Pavage Modernes at $2.15 a square yard. A sidewalk flag with a fine grain surface was also included in the list. It is called "Silex" and costs $3.21. The committee does not bind itself to accept these flags. It asks the authority of council to purchase as needed. Three tenders were accepted for laying curbstones. They were B. Beaucage at 11 1-2 cents a lineal foot; F. D. Lawrence at 11 1-2 cents, and L. Giguere at 11 1-4 cents. For laying flagstones the tender of L. Giguere at 37 1-2 cents a square yard being the lowest, was accepted. For laying flagstone crossings the tender of Leclaire and Payette at 8 1-2 cents a lineal foot being the lowest, was accepted. F. D. Lawrence offered to lay scoria blocks on sand at 49 cents a square yard.

It was accepted. The supply of asphalt in bulk was accepted from the Elder Albane Company at $29.75 a ton.

St. Pierre, Que.
Henault & Heffernan, Montreal, have been awarded the contract for laying of a system of sewers for the town of St. Pierre, to cost $100,600.

Toronto, Ont.
The Excelsior Contracting & Paving Company have been awarded the contract for the city's supply of iron and steel pipe for 1909. The contract price was $29,059.85.

Railroads, Bridges and Wharves

Brantford, Ont.
Tenders will be received until April 24th for the construction of the following works for the Township of Brantford: (1) Reinforced concrete arch bridge, span 63 feet over Whiteman's Creek, at Burrows' Bridge; (2) concrete pier on pile foundation and two concrete abutments for bridge over Fairchild's Creek, near the residence of Mr. Daniel Whiting; (3) concrete arch, span 21 feet over Houlding's Creek, at the Atkinson Bridge. This work also includes the excavation of a new channel for the creek and the filling in of the old bridge; (4) concrete arch, span 8 feet, opposite the property of Mr. Charles Ireland, near the schoolhouse in section 21. Plans and specifications may be seen at the office of W. H. Fairchild, C.E., Township Engineer, 54 Market street, or at the office of James A. Smith, Township Clerk, Court House, Brantford.

Emerson, Man.
Construction will shortly be started upon the G. N. R. branch from Emerson to Winnipeg.

Edmonton, Alta.
The joint civic committee representing Edmonton and Strathcona has decided that the proposal that the two cities, assisted by the Provincial Government, should build a half million dollar high level bridge across the Saskatchewan river, entails too great an expenditure, and the sheeme has been unanimously rejected. It was decided to appeal to the C. P. R. to proceed with the proposed railway bridge, which would be assisted by the two cities and by the Government.

For some time past the C. P. R. and the G. T. P. have had surveyors in the field with a view to the construction of a railway from Edmonton to Athabasca. According to reports these companies are likely to be forestalled by an American syndicate. Mr. J. A. Waddell makes the following statement: "We have just secured the contract for the undertaking of all the engineering work of the Alberta and Great Waterways Railway extending from Edmonton to Fort McMurray, at the head of navigation on the lower reaches of the Athabasca river. With branch lines it will have a length of about three hundred and fifty miles. It is our intention to place survey parties in the field within sixty days and this season will see the construction work well advanced from the Edmonton end. The entire line will be completed within three years, or twelve months ahead of the time limit for the construction. The charter has been acquired by Messrs. W. R. & D. O. Clarke, bankers of Kansas City, and the enterprise is backed by the guarantee of the Alberta Government in five per cent. fifteen-year bonds to the extent of $20,000 per mile. The capital will be mainly European. I recently returned witn Mr. W. R. Clarke from a trip abroad where he made the necessary financial arrangements. Messrs. Clarke will probably build various sections of the line themselves, but contracts for other sections will be awarded to sub-contractors. The route from Edmonton will run north by east a distance of 125 miles to a point west of Lake Labiche and thence in an almost straight line to Fort McMurray. It is also proposed to build a branch line of thirty miles to the rich farming district near Lake Lachine."

Guelph, Ont.
The Railway Commission have issued an order that the G. T. R. construct a new depot in this city.

Peterborough, Ont.
The ratepayers will probably be asked to vote on a by-law to provide for the construction of a reinforced concrete bridge at Smith street. City Engineer Hay estimates the cost at $37,200.

St. John, N.B.
Louis Coste, consulting engineer of the Dominion Public Works Department, is reported to have been requested to prepare plans for terminal harbor facilities here for the Grand Trunk Pacific Railway Company.

St. Mary's, Ont.
Blanshard and Usborne townships voted April 12th on by-laws to bonus the St. Mary's & Western Ontario Railway to the extent of $20,000 for each township. In Blanshard the by-law was defeated, but in Usborne it carried by a large majority. These by-laws were designed to carry this railway, which connects the C. P. R. at Embro, one step farther on its projected route to Sarnia. It is thought that the by-law in Blanshard may be submitted again to the electors.

Toronto, Ont.
City Engineer Rust will probably recommend a high bridge or swing bridge for cars at the western gap.

Tuscarora, Ont.
Tenders addressed to S. J. M'Kelvey, Clerk, Township of Onondaga, will be received until May 4th for the supply of material and construction of two concrete abutments for an iron bridge. The abutments will measure 90 cubic yards.

Vancouver, B.C.
General Manager Chamberlain, of the G. T. P., recently announced, before leaving for North Bay, that an air line would be built to Vancouver, involving the abandonment of the proposed north and south branch line now roughly surveyed, from the vicinity of Port George on the main line. It will reach here from the northeast. The northern junction will be at the point of the main line near the Yellow Head Pass.

London capitalists are stated to have secured 800 feet of water-frontage in Hastings townsite for the construction of large wharves. The area of the property acquired is about five acres and the wharves will be the finest in the West. H. A. Jones, of this city, is local agent of the purchasers.

Winnipeg, Man.
The C. P. R. will extend the Mowbray branch in Southern Manitoba to connect with the Soo line at Adams, N.D., thus giving them another direct line to the Twin Cities. The work will be proceeded with at once.

Early next fall the Great Northern Railway Company will have a line into Winnipeg connecting with the Hill system at Emerson. This was determined definitely last week, when James Fisher, Hill's representative, filed plans and specifications with Premier Roblin as railway commissioner. The plans show an air line from the boundary about sixty-five miles, and work will start at once on a depot on land owned by the Great Northern on Pauline street between Pacific and Ross, the intention being to have a line in operation by the date mentioned.

The G. N. R. will build two subways, one at Nena street and one at Isabel. The plans of the company also show that a modern depot will be erected on Pauline street between Pacific avenue and Ross.

AWARDED.

Fredericton, N.B.
The contract for the construction of two masonry piers and two concrete abutments for the Hartt's Island bridge at Fredericton Junction has been awarded to Albert Brewer at $3,600.

Montreal, Que.
The G. T. P. has placed with the Algoma Sault Ste. Marie Steel Company an order for 22,000 tons of 80-pound steel for rails.

Winnipeg, Man.
The contract for the substructure for the National Transcontinental Railway bridge over the Red river at Winnipeg will probably be awarded to Haney, Quinlan & Robertson, of St. Boniface, who are the contractors for the terminal shops at St. Boniface. The contract for the superstructure will go to the Dominion Bridge Company. The contracts have not yet been awarded by the Government, but it is understood that these are the tenders recommended for acceptance by the National Transcontinental Commission. The substructure will cost about $245,000 and the superstructure about $240,000.

Public Buildings, Churches, Schools, etc.

Battle River, Alta.
Tenders addressed to J. N. Franklin will be received until April 29th for improvements to school house.

Berlin, Ont.
The authorities are considering the erection of a tuberculosis hospital.

Brandon, Man.
Building operations will shortly commence on the proposed labor temple.

Plans are being prepared for a new Methodist church, corner of 15th street and Victoria avenue. S. E. Clement, G. Denison, J. Higginbotham and F. W. Wearry are members of the Building Committee.

Camilla, Ont.
Tenders addressed to W. T. Bailey, Orangeville, will be received until April 24th for the erection of a Presbyterian manse at this place.

Cobourg, Ont.
The fair buildings will be remodelled this season.

Collingwood, Ont.
A by-law to raise $30,000 for a new school building will probably be submitted to the ratepayers at an early date.

Dauphin, Man.

The Salvation Army will erect new barracks at a cost of $2,000.

The School Board will submit a by-law to raise $60,000 for school purposes. $40,000 of this amount will be devoted to the erection of a new school to replace the one destroyed by fire last January, and $12,000 to an addition to the south end school.

Edmonton, Alta.

The city will ask Mr. Carnegie for a grant of $75,000 for a public library.

Estevan, Sask.

The ratepayers have approved a by-law to raise $10,000 for the erection of a town hall.

Goderich, Ont.

A new six-roomed school building will be erected in the south end of the town.

Guelph, Ont.

Plans will be prepared for the winter fair annex.

Hamilton, Ont.

The project of erecting an up-town union station is again under discussion.

Ingersoll, Ont.

Nearly $6,000 has been subscribed towards the erection of a hospital.

Kingston, Ont.

Tenders addressed to H. P. Smith, architect, will be received until April 27th for the plumbing of a large orphanage building in this city. Plans on application.

Markham, Ont.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until May 1st for post office fittings. Plans and specifications obtainable of D. Meyer, Clerk of Works, Public Building, Markham, Ont., and at the Department at Ottawa.

Medicine Hat, Alta.

A site for the new court house has been selected and building operations will start at once.

Montreal, Que.

A permit has been issued to the Sisters of Hotel Dieu for the erection of an additional hospital building to cost $5,400.

Professor E. Nobbs, architect, McGill University, has awarded the general contract for the erection of a power building for the University to Byers & Anglin, general contractors, this city.

Tenders addressed to W. J. White, Secretary-Treasurer, will be received until April 24th for the erection of a new technical school. Plans and specifications at room 31, Street Railway Building.

Nelson, B.C.

The erection of a three storey brick Y. M. C. A. building at Baker and Stanley streets is contemplated at a cost of $30,000. Wm. Waldie, R. S. Lennie and R. W. Hurlbert are interested.

North Bay, Ont.

W. B. Angus, architect, has prepared plans for an extension to the hospital.

Orillia, Ont.

The Council has accepted an offer of $12,500 for a Carnegie library.

Ottawa, Ont.

The Hospital Board have purchased a site for a Nurse's Home. Operations will not be started this season.

The Council have approved plans for the proposed registry office. No decision has yet been reached in regard to the grand stand.

All Saints' Anglican Church will be enlarged. A new rectory and other improvements are also under discussion.

Orangeville, Ont.

George E. Island, Secretary-Treasurer, will receive tenders until April 21st for repairs to school house.

Portage la Prairie, Ont.

The Bank Street Presbyterian Church have taken up their option on the property at the corner of Cooper and O'Connor streets, for the site of a new church. Rev. Mr. Turnbull is pastor. Building is not contemplated in the near future.

Revelstoke, B.C.

The hospital directors have decided to build a new wing at a cost of $16,000.

Richibucto, N.B.

The school trustees will borrow $7,000 for the erection of a new school, plans for which will be changed to come within this amount.

Sicamous, B.C.

Tenders addressed to G. C. Tunstall, Government Agent, Kamloops, B.C., will be received until April 24th for the erection of a jail at this place.

Strathcona, Alta.

The plans for the proposed municipal building will probably be enlarged so as to include a fire station, police station and city offices.

Strathroy, Ont.

Tenders addressed to F. W. Atkinson will be received until May 1st for painting and kalsomining the hospital at the Middlesex House of Refuge.

Springhill, N.S.

A modern brick high school, to contain ten rooms, will be erected here this season.

Stratford, Ont.

A belfry will be added to St. James' Anglican church.

The Collegiate Board will ask the City Council to provide $16,000 for an addition to the Collegiate Institute. J. S. Russell has been appointed architect.

Sturgeon Falls, Ont.

Tenders addressed to J. D. McLean, Secretary Department of Indian Affairs, Ottawa, will be received until May 1st for erection of frame school building on stone foundation on Bear Island, Temagami. Plans and specifications at office of G. P. Cockburn. Indian agent, Sturgeon Falls.

St. John, N.B.

The Victoria Street Baptist Church will be enlarged this season.

Sydney, N.S.

J. J. Curry, Secretary, School Commissioners, invites competitive plans for the proposed new academy building.

Toronto, Ont.

Tenders will be called shortly for the addition to the Parliament Buildings, estimated cost $500,000.

The Board of Education are asking the Board of Control to pass an $80,000 item in the building debenture account for the completion of the Kent school.

The West Presbyterian Church may purchase a site on the corner of College street and Montrose avenue for the erection of a new church.

The Public Library Board have agreed to accept the site offered by the City Council, at the corner of Gerrard street and Broadview avenue, for the Riverdale branch library.

The Board of Education are considering the erection of a new technical school in the rear of the present building at a cost of about $100,000.

The trustees of the Rosedale Presbyterian church have applied for a permit to erect a church at the corner of South Drive and Huntley street, at a cost of $30,000.

A permit has been granted to the directors of the Hospital for Incurables for a three storey and basement brick and stone nurse's home on Dunn avenue. Estimated cost $22,000.

The trustees of St. James' Cathedral have applied for a permit to erect a building for club and school purposes, at the corner of Church and Adelaide streets, to cost $65,000.

At the meeting of the Finance Committee of the Board of Education last Monday, it was decided not to take fresh tenders for masonry work at the Riverdale High School, as proposed.

Vancouver, B.C.

The Exhibition Association invite competitive plans until May 7th for their main building.

The North Vancouver Mission will be enlarged at a cost of $5,000. H. B. Watson, architect.

Victoria, B.C.

The School Board have approved preliminary plans for the new $45,000 school building submitted by Architect J. C. Keith.

The Provincial Government is stated to have acquired additional property in the rear of the Parliament Buildings, with a view to extensions.

Westmount, Que.

Ross & McFarlane, architects, 1 Belmont street, Montreal, are inviting tenders up to the 23rd of April for the erection of the new St. Matthias Anglican church.

Windsor, Ont.

It is proposed to erect a $30,000 building for the accommodation of various Protestant brotherhoods.

Winnipeg, Man.

Havergal College will be enlarged this summer at an estimated cost of $35,000.

It is the general impression that work will start this year on the proposed union station for the Great Northern and Northern Pacific.

The School Board have decided to build a new collegiate institute on the site of the present Albert and Victoria schools. Plans are being prepared and contracts will be let shortly.

Tenders addressed to R. H. Smith, Secretary-Treasurer, Winnipeg Public School Board, will be received until May 6th for the erection of iron fences at the Collegiate, Dufferin and Norquay schools. Specifications may be obtained of J. B. Mitchell, Commissioner of Buildings and Supplies, School Board office.

The School Board have passed recommendations that tenders be called for the erection of an iron fence around the sites of the Collegiate, Dufferin and Norquay schools at on estimated cost respectively of $1,000, $925 and $800, also that the city council be requested to install electric fire alarms in the Cecil Rhodes, Lord Selkirk and King Edward schools.

AWARDED.

Banff, Alta.

The contract for the $10,000 club house, for the Alpine Club, has been awarded.

Halifax, N.S.
The contract for heating the new technical college building was awarded to Longard Brothers.

Haileybury, Ont.
Paul A. Cobbold, Secretary, School Board, states that the contract for erecting an eight room brick school has been awarded to G. F. Turney, of Trenton, Ont.

Ingersoll, Ont.
The contract for a new school in Ward One has been awarded to P. M. Secord & Son, of Brantford, at $10,269.

Moose Jaw, Sask.
The contract for the new $70,000 Y. M. C. A. building has been awarded to R. N. Willoughby, of Brandon.

Owen Sound, Ont.
The contract for improvements to the town hall has been awarded to Green & McInnis, at $4,883.

Vancouver, B.C.
The contract for the Vancouver Lawn Tennis Club's new pavilion on Denman street has been awarded to Purdy & Lonergan.

Winnipeg, Man.
The Steam Power & Heating Company were the successful tenderers at $10,200, for the installation of a heating and ventilating system in the La Verandrye school.

The contract for the new horse show pavilion has been awarded to G. H. Archibald & Company. Estimated cost $48,000.

The contract for the supply of 1,000,000 brick for the Parliament Buildings has been awarded to the Edmonton Brick Company, Limited, and the Peter Anderson Company, Limited, for 500,000 brick each. The price was $8.75 delivered on the grounds.

Residences

Belleville, Ont.
Dr. Caverlery's brick residence was destroyed by fire last week. Loss $4,000.

Montreal, Que.
Recent building permits include: Edward Knox, 61 Craig street west, alterations to property St. Urbain street, $2,000; H. Desjardins, 1202 St. Denis street, alterations to property St. Denis street, $2,500; Arsene Venne, 125 Notre Dame street west, one storey house, Joliette street, $1,800; F. B. Locker, 113 Notre Dame street west, house containing six dwellings, Crescent street, $25,000; Joseph Malo, 83 Dufresne street, three houses containing five dwellings, Dufresne street, $10,500; John Duncan, 218 Mountain street, two houses containing eight dwellings, Mountain street, $16,500; Chas. Archer, N. Y. Life Building, three storey residence, Sherbrooke street west, $16,000; S. Boutin, Labelle street, house containing five dwellings, Labelle street, $4,000; A. Forget, 372 Dorion street, one storey addition Chausse street, $1,800; Hyram Sykes, 430 Strathcona avenue, three houses containing six dwellings, Trafalgar avenue, $27,000; F. Durivage, 567 Bourbonniere street, house containing two dwellings, Marquette street, $2,000; H. Gauthier, 396 Amherst street, three houses containing six dwellings, Mt. Royal avenue, $15,000; G. R. Lighthall, N. Y. Life Bldg. three storey residence, Cedar avenue, $30,000; Chas. Corbeil, Parc Lafontaine, two houses containing six dwellings, Parc Lafontaine, $6,100; Jos. F. Chartier, 33 Hudon street, five houses containing fifteen dwellings, St. Germain street, $12,000; Laurin Construction Company, 112 St. James St., two houses containing six dwellings, Mance street, $9,000; D. Torir, 1852 Notre Dame street, house containing two dwellings, Nicolet street, $1,800; Mde. Mederic Martin, 929 Logan street, two houses containing six dwellings, Papineau avenue, $6,000; Ed. Lamoureux, 700 Belanger street, two houses containing four dwellings, Belanger street, $3,000.

Ottawa, Ont.
Recent building permits include: George Ambridge, six solid brick dwellings, First avenue, $10,000; Horace McGuire, brick veneered dwelling, Clemow avenue, $5,000; D. H. McMurray, brick apartment, Frank street, $4,500; E. B. Butterworth, apartments, Cooper street, $15,000; A. Carpenter, six brick veneered dwellings, Bridge street, $7,000; James Brownlee, brick veneered dwelling, Gladstone avenue, $2,000; Elgin Syndicate, apartments, Elgin street, $18,000; F. W. Lord, double brick veneered dwelling, Waverley street, $5,000; H. K. Egan, alterations to dwelling Cooper street, $2,000; D. V. Ranger, brick veneered dwellings, Daly avenue, $8,000; Prof. Adam Shortt, solid brick dwelling, Laurier avenue east, $12,000; J. B. Myrand, brick veneered dwelling, Wilbrod strot, $5,500; J. T. Hodgins, double brick veneered dwelling, Strathcona avenue, $3,200; Sir Wilfried Laurier, brick garage, Laurier avenue, east, $2,500; Patrick Labelle, six solid brick dwellings, St. Andrew street, $7,000; Mrs. H. A. Anderson, brick veneered dwelling, Carling avenue, $4,000; William Burgess, brick veneered dwelling, Spadina avenue, $2,000; John Baird, brick veneered dwelling, Spruce street, $2,100; Frank Pedley, brick veneered dwelling, Gladstone avenue, $2,000.

Peterborough, Ont.
J. C. Shook has a permit for a brick dwelling on McDonnell street to cost $4,000.

The "Inverlock" summer resort on Sandy Lake, owned by W. J. Irwin, was destroyed by fire last week at a loss of $10,000.

Portage la Prairie, Man.
Nicholas Garland will build six modern brick residences this spring at a cost of $3,500 each.

Strathclair, Man.
The following farmers are making preparations for the erection of new residences this summer: Marr Black, J. Ferguson, W. Campbell, W. Grundy, A. McBain and J. McTavish.

Toronto, Ont.
Simpson & Young, 17 Toronto street, have prepared plans for a residence and stable for W. T. Harris. Estimated cost $16,000.

Recent building permits include: Franks & Vose, two pair brick dwellings, Margueretta street, $8,000; D. Kerr, brick dwelling, Enderberry avenue, $3,000; C. W. Chadwick, pair brick dwellings, Springhurst avenue, $7,000; Hector Gunn, brick apartments, Carlton street, $12,500; A. Pinkey, brick dwelling, Margueretta street, $2,500; J. T. V. May, brick dwellings, Shannon street, $6,000; R. C. Vaughan, five pair brick dwellings, Bartlett avenue, $15,000; R. A. Shields, pair brick dwellings, Sidney street, $4,200; W. Pinkerton, brick dwellings, Givens street, $4,000; D. M. O'Meara, brick dwelling, Lynwood avenue, $5,000; Alexander & Son, pair brick dwellings, Huron street, $4,000; Wm. Heap, five brick dwellings, Marion street, $15,000; W. K. George, brick dwelling, Pelham place, $15,000; S. G. Smith, pair brick dwellings, Margueretta street, $4,000; Lewis LeGrow, brick dwellings, Lansdowne avenue, $3,800; H. B. Woodley, brick dwelling, Foxbar road, $4,500; W. W Hiltz, Broadview avenue, $2,500; F. W. Hill, three brick dwellings, corner College and Sorauren, $5,400; R. Robson, two pair dwellings, Dufferin street, $9,000; J. B. Davison, brick apartments, corner College and Huron, $4,500; Robert Watt, pair brick dwellings, Constance street, $5,000; Walter Scott, pair brick dwellings, Margueretta street, $4,000; A. G. Love, pair brick dwellings, Ossington avenue, $4,000; Mr. Harman, pair brick dwellings, Lippincott street, $3,500; E. G. Switzer, two pair brick dwellings, Lynd street, $7,500; Jos. Bryant, pair brick dwellings, Deleware avenue, $4,500; E. P. Atkinson, two brick dwellings Marmaduke street, $7,500; E. P. Atkinson, pair brick dwellings, College street, $6,000; T. P. Stewart, seven brick dwellings St. Clair avenue, $21,000; Caroline Lakey, pair brick dwellings, Deleware avenue, $4,000; G. V. Burgess, brick dwelling, Balmoral avenue, $3,500; W. P. Near, pair brick dwellings, Shannon street, $4,400; W. H. Howard, two pair dwellings, Pape avenue, $5,000; G. L. Thompson, pair brick dwellings, Dufferin avenue, $4,000; J. T. & H. Hutson, pair brick dwellings, Woodlawn and Farnham, $4,500; R. C. Bustard, two brick dwellings, corner Spadina and Lowther, $4,000; L. A. Beatty, brick dwelling, near College, Lind avenue, $3,000; R. T. Brown, three brick and stone dwellings, Admiral road, $13,500; E Mabee, pair brick and stone dwellings, Marmaduke street, $4,000; Thos. Parkin, pair brick dwellings, St. Clarens avenue, $3,000; Cameron Stewart Company, three brick dwellings, Alhambra avenue, $9,000; A. Knibb, pair brick dwellings, Sorauren avenue, $6,300; Cameron Stewart Company, three brick dwellings, Alhambra avenue, $9,000; G. McHugh, brick dwellings, Stone house screscent, $3,000; J. Drury, two pair brick dwellings, Ossington avenue, $6,000; Oliver Spanner, dwelling, Radford street, $3,800; T. A. Fleming, two brick dwellings, Marion street, $4,400; A. R. Paterson, brick dwelling, Boustead street, $4,000; Wm. Lightle, brick dwelling, Langley avenue, $3,800; F. Courtmarche, two pair brick dwelling, College street, $10,000; F. Courtmarche, two brick dwellings, College street, $6,500; W. J. Griffiths, pair two storey and attic brick dwellings, Galley avenue, $5,000; F. P. Solomon, pair two storey brick dwellings, Russett avenue, $3,600; Wm. Puckering, brick dwelling, Wright avenue, $4,000; Weismiller & Mackenzie Bros., 3 brick dwellings, Margueretta street, $7,500.

Victoria, B.C.
A building permit has been issued to Frank Partridge for a dwelling at the corner of Fairfield road and Cornwall street to cost $2,700.

Winnipeg, Man.
Recent building permits include: B. C. Cockshutt, two dwellings, Inkster avenue, $2,000; Dunn & Wallace, dwelling, Maryland street, $4,500; G. W. Allan, dwelling, Roslyn avenue, $22,000; F. E. Sprague, residence, Academy road, $5,500; H. F. Osler, dwelling, Wellington crescent, $20,000; Walter Moss, dwelling alterations, Roslyn road, $9,000; W. A. Machaffie, dwelling, Roslyn road, $12,000; S. Johnson, cottage, Toronto street, $2,000; S. Johnson, two double dwellings, Pembina, $6,000; H. R. Soot, dwelling, Central avenue, $6,500.

Barrow Bros. will build a 2 1-2 storey dwelling on Gertrude avenue at an estimated cost of $7,500.

W. W. Cross and E. M. Counsell have plans completed for a three and one-half storey block to be erected on the corner of Wardlow and Stafford at a cost of $45,-

000. The dimensions are 120 by 46 feet. There will be six stores and nine suites in the building. The permit will be issued shortly. J. D. Atchison is the architect.
Strathclair, Man.

West Toronto, Ont.
Recent building permits include: Jas. Pennice, brick dwellings, May street, $2,500 each; John Brown, pair dwellings, Gilmour avenue, $3,600; John S. Proctor, two brick houses, Clendenan avenue, $4,200; W. C. Gregory, two brick houses, $2,400; Wm. Walker, brick house, Weston road, $2,000; C. A. Jones, pair dwellings, Fairview avenue, $3,000; Lumb and Andrews, brick dwelling, Fairview avenue, $2,300; William A. Held, pair brick veneer dwelling, $3,600; E. Boon and J. Miller, solid brick dwelling, Medland street, $2,600; Isaac Smith, solid brick dwelling, Quebec avenue, $2,800.

AWARDED.

Montreal, Que.
Joseph Perrault, architect, 17 Place d'Armes Hill, has awarded the following contracts for the erection of eight flats on Park Avenue for Mr. J. M. Dorion: Lumber, Latour & Depuis; carpentry and joinery, Joseph Lemay; mill work, Limoges & Freres, Terrebonne; steel framing, Dominion Bridge Company.

Wright & Son, architects, 204 St. James street, have awarded the general contract for the erection of an apartment house on Crescent street for Mr. F. B. Locker to Thos. Wand, general contractor.

Toronto, Ont.
Hall & Son, Toronto, have the contract for a $16,000 apartment building for Thos. McIlwain.

Business Buildings and Industrial Plants

Aberdeen, Sask.
The C. N. R. contemplate the erection of stock yards, freight shed and an extension to the station.

Aylmer, Ont.
Tenders addressed to F. S. Baker, architect, Traders Bank Building, Toronto, will be received until April 24th for alterations and additions to the Traders Bank at this place. Plans and specifications may be seen at the Traders Bank, Aylmer.

Brandon, Man.
The National Elevator Company will proceed at once with the construction of a chain of elevators in Western Canada. Construction will be placed in the hands of local contractors.

Calgary, Alta.
The Winnipeg Paint & Glass Company will extend their warehouse.

Chatham, Ont.
The Wallaceburg glass factory was destroyed by fire last week at a loss of $150,000.

Edmonton, Alta.
The Twin City Manufacturing Company, of Strathcona, is negotiating with the city council for a site in this city.

Fort Frances, Ont.
Plans are progressing for the extensions and improvements to be carried out by the C. N. R.

Fort William, Ont.
The C. P. R. will establish a plant for creosoting railway ties.

The ratepayers will probably be asked to vote on a by-law to aid a car factory and wire works.

Fredericton, N.B.
Sir William Van Horne is leaving this week for England to interest English capitalists in a scheme for establishing in New Brunswick, in connection with the Grand Falls water power, large pulp, paper and saw mills. It is planned to spend seven million dollars.

Galt, Ont.
Work will shortly comence on a block of three stores for Scott & Bennett.

Hamilton, Ont.
Dixon Bros. warehouse was damaged by fire last week to the extent of $5,000.

London, Ont.
The warehouse of H. T. Reason & Company was damaged by fire last week.

Montreal, Que.
Edward Knox, 61 Craig street west, has a permit for a store on St. Urbain street. Estimated cost $8,000.

The Dominion Bank has a permit for the erection of a bank building on St. Lawrence Boulevard. Estimated cost $18,000.

Jos. Sawyer, architect, this city, has prepared plans for a three storey building, to contain stores and dwellings, for F. Harel. Estimated cost, $55,000.

J. Eveleigh & Company, trunk manufacturers, have obtained a permit for the erection of a factory on Richelieu street, St. Henry, at a cost of $70,000.

J. A. Jacobs, 171 St. James street, has been granted a permit for a block of stores and warehouses on St. Catherine street west. Estimated cost $123,000.

Mitchell & Crighton, architects, Inglis building, are taking tenders for the marble work and plastering of the new Lyman's Limited warehouse on St. Paul street.

Hutchison, Wood & Miller, architects, Royal Insurance Building, have just taken tenders for the erection of a warehouse on Alexander street for McFarlane, Son & Hodgson.

Specifications are being prepared for the remainder of the work on the new block of stores under construction for Mr. J. A. Jacobs, corner of Alexander and St. Catherine streets. Mitchell & Crighton, architects.

Ottawa, Ont.
The Capital Scale, Brass & Iron Foundry Company have purchased a site for the erection of a new factory.

Peterborough, Ont.
A permit has been issued to J. M. Brooks for three brick stores on George street to cost $4,000.

The East City furniture factory, Peterborough, is to be enlarged during the coming summer. An addition one-half the size of the present building will be built to the rear.

Prescott, Ont.
The C. P. R. roundhouse was destroyed by fire recently. Loss $12,000.

Port Arthur, Ont.
It is stated that on June 1st the C. N. R. will break ground for a new $300,000 hotel to be erected here. The building will be of steel and stone construction, four storeys high, 150 feet square. J. D. Matheson, Winnipeg, architect.

Quebec, Que.
The vinegar factory of A. Robitaille was recently destroyed by fire at a loss of $20,000.

Regina, Sask.
Tees & Persse, of Winnipeg, will shortly erect a warehouse and office building.

Thessalon, Ont.
The ratepayers have approved a by-law to loan $10,000 to a saw mill concern which will expend $25,000. F. H. Lawrence, of Ekoba, is promoting the company.

Three Rivers, Que.
The store of B. Beaulac was destroyed byfi re last week at estimated loss of $10,000.

Toronto, Ont.
The T. Eaton Company have obtained permission from the Board of Control to erect a new twelve storey factory building on Trinity square. Only eight storeys will be constructed at present.

It is stated that Chas. C. Cummings, of the Slater Shoe Company, has acquired the Vokes building on the corner of Yonge and Adelaide street, where he will erect a modern business block at an estimated cost of $200,000.

The American Laundry Machinery Manufacturing Company, Chicago, Ill., contemplate locating a Canadian branch factory in this city. The matter is in charge of Mr. A. Kreutner, president of the concern, who has already twice visited Toronto in this connection, but has not yet selected a site.

Recent permits for business buildings include the following: Turnbull Elevator Company, four storey brick factory, John street, $6,000; J. E. Price, pair brick stores and dwellings, Roncesvalles avenue, $6,000; M. S. Thompson, six attached stores and dwellings, Bloor street, $25,000; E. D. Brown, pair brick stores and dwellings, Queen street west, $5,000; J. S. Sharpe, two brick stores and dwellings, Roncesvalles avenue, $6,000; R. T. Smith, three brick stores and dwellings and three stables, Roncesvalles avenue, $6,000; Scarboro' Athletic Grounds Company, brick and concrete grand stand, Queen street east, $4,000; G. L. Thompson, pair brick stores and dwellings, Bloor street west, $7,000; Clarke & Willinsky, brick moving picture theatre, Queen street east, $5,000; Kindel Bed Company, brick and concrete factory, corner Clifford and Stanley terrace, $8,000; J. J. McKinney, pair brick stores and dwellings, College street, $6,600; R. T. Smith, four brick stores and dwellings, corner Roncesvalles and Galley avenues, $9,000.

Vancouver, B.C.
A permit has been issued to W. A. Bauer for the erection of a 7-storey hotel building, corner of Hastings and Howe streets.

The Dominion Carbolinium Works will erect a large plant and expend several thousand dollars in modern machinery and improvements.

Victoria, B.C.
Fresh tenders will be taken for the new building for the Times Printing & Publishing Company.

Welland, Ont.
E. O'Connor, Hamilton, Ont., will probably establish a brick plant here. Capacity, 20,000 a day. Estimated cost $9,000.

Winnipeg, Man.
The Manitoba Rolling Mills Company will spend $200,000 on extensions this season.

A $17,000 block will be erected on the corner of Langside street and Ellice avenue.

It is stated that negotiations are under way for the purchase of the building known as the Fort Garry Court. It is rumored that the building will be converted into a large hotel.

The Ontario, Manitoba & Western Land Company have been granted a permit for an addition to their block to cost $19,000.

Northwood & Noffle have plans for an apartment block on Spadina avenue to cost $30,000.

The McLaughlin Carriage Company have been granted a permit for a $23,000 garage on Merryland. G. H. Archibald, builder.

The International Roturbine Engine Company of America, Minneapolis, Minn., propose to locate a Canadian branch factory in this city. W. H. Thompson is president and C. W. Cornish general manager.

Plans have been prepared for a $1,000,000 bank building for the Bank of Montreal to be modelled after the style of the headquarters of the Montreal office.

The Winnipeg Electric Railway Company will erect a large addition to the north end car barns. Three or four power sub-stations will also be erected in the city.

Yarmouth, N.S.

The new Burrill-Johnson Iron Company's buildings at Yarmouth, will be of brick and they will be equipped with the most modern machinery. Providing the company secure certain concessions from the town they will engage in steel shipbuilding on an extensive scale. The company ask to have their rate of assessment fixed at a sum not more than $20,000, free water, and a free site for their shipbuilding plant.

AWARDED.

Edmonton, Alta.

Pheasey & Batson have been awarded the contract for the Edmonton Iron Works' new building, at a contract price of $35,000. The same firm have also secured the contract for Dr. McLean's business block, valued at $35,000.

Montreal, Que.

D. G. Loomis & Sons have been awarded the contract for the new factory to be erected by J. Eveleigh & Company.

H. G. Vogel Company, St. George street, have been awarded the contract for the installation of a sprinkler system in the Slater Shoe Company's factory.

The Hilder Daw Construction Company, 207 St. James street, have been awarded the contract for the renovation of E. B. Eddy's warehouses on St. Peter street.

The Century Electric Company, 581 St. Paul street, have been awarded the contract for electrical work in the premises of Gunn, Langlois & Company, St. Vincent and St. Paul streets.

Hutchison & Wood, architects, Royal Insurance Building, have awarded the contract for excavations, masonry and brickwork, for the erection of a new warehouse for the Dominion Oilcloth Company, to Reid, MacGregor & Reid.

Revelstoke, B.C.

A. F. Dunlop, architect, Lindsay Building, Montreal, has awarded the contract for the erection of a bank building for the Molsons Bank to Byers & Anglin, general contractors, Montreal.

Morrisburg, Ont.

Weeks & Keefer, architects, Ottawa, Ont., have awarded the general contract for the erection of a bank building for the Molsons Bank to Byers & Anglin, general contractors, Montreal.

Vancouver, B.C.

The Vancouver Construction Company have the contract for a $30,000 office building on Hastings street for C. E. Robertson.

Vernon, B.C.

Peden & McLaren, architects, 20 St. Alexis street, Montreal, have awarded the general contract for the erection of a bank building for the Bank of Montreal, to Byers & Anglin, general contractors, Montreal.

Victoria, B.C.

The contract for the renovation of an office block on Langley street has been awarded by T. S. Gore to Wm. Ashe at $10,000.

Dinsdale & Malcolm have obtained the contract for the new building, corner of Langley and Fort street, for Kerr Bros. Approximate cost $8,500. The same firm have the contract for the B. C. Electric Railway Company's new building.

Power Plants, Electricity and Telephones

Bracebridge, Ont.

A proposition is mooted to construct an electric road from Bracebridge or South Falls to the mines.

Berlin, Ont.

The ratepayers of this town last week carried two money by-laws, which were defeated at the municipal elections. One by-law was to raise $40,000 to purchase the necessary machinery for the distribution of Niagara power, and the other to raise $8,000 for new gas mains.

Cobourg, Ont.

The Town Council has granted the request of the Provincial Steel Company to construct a line of railway from its plant to the lake front. The Cobourg, Port Hope and Havelock Electric Railway Companies have also been granted franchises to enter the town.

Chippawa, Ont.

The Council has granted the Welland County Telephone Company a franchise to extend its telephone lines to this village.

Dunnville, Ont.

The construction of the first five mile stretch of steel on the Dunnville, Wellandport & Beamsville Electric Railway will soon be under way. Work on the grading will start early in May. Tenders for the rails, poles and other equipment will be opened at once.

Fernie, B.C.

The municipality is contemplating the ownership of the electric light and water water plant, which is at present owned by the Crow's Nest Pass Electric Light & Power Company, Limited.

Fort William, Ont.

At a special meeting of the joint railway commission held recently, it was decided to purchase a new generator, large enough to operate the entire system, and place it in the Kam Power Company substation.

Grand Falls, N.B.

Additional equipment consisting of air compressors, electric motors, drills, tunnelling machines, pumping, hoisting engine, derricks, concrete mixer, rock crushers, gasoline tow boat, scows, machine and blacksmith shop tools, etc., will soon be purchased by Frank B. Gilbreth, of New York, N.Y., to be used in connection with the construction of the hydro-electric plant on the St. John River, at Grand Falls, N.B., for the Grand Falls Power Company. This equipment is for the contractor's plant. The hydro-electric machinery for the permanent equipment of the main power plant will not be purchased by Mr. Gilbreth, who has the contract only for the construction work involved in the development of the water power. John B. McRae, Ottawa, Ont., is chief engineer, and Ralph Mershon, New York, N.Y., electrical engineer.

Hamilton, Ont.

The Street Railway will shortly commence the reconstruction of its James street tracks.

The city will probably do the work of putting its fire and police alarm system wires under ground instead of making an arrangement with the Bell Telephone Company. The company estimated the cost for the cable at about $1,000 a mile, and it is said it would charge the city $264 a mile a year rental for the conduit. Mr. Barrow, consulting engineer, thinks the city can put the wires under ground for about $1,300 a mile.

Listowel, Ont.

The electric lighting by-laws submitted to the ratepayers on April 19th was carried. The town will have 265 lamps on the street.

London, Ont.

The Street Railway Company are considering the advisability of puting in a producer gas plant, and not taking Niagara power. The Colonial Engineering Company has inspected the company's plant, and is prepared to furnish the power at $22 per horse-power.

Midale, Sask.

A rural telephone system will probably be in operation here in the near future. Meetings are being arranged at which the matter will be discussed and arrangements made for beginning work.

New Glasgow, N.S.

A bill has been introduced into the local legislature to confirm an agreement by which all the plant, franchises and good-will of the New Glasgow Electric Light Company, Limited, are to be transferred to the Egerton Tramway Company, Limited.

Ottawa, Ont.

It is stated that work will shortly be commenced on the laying of tracks for the new electric railway from Morrisburg to Ottawa.

Prince Albert, Sask.

At a special council meeting held recently, it was decided to secure a franchise from the Dominion Government to develop 10,000 horse-power at Coal Falls. An expert engineer will be engaged immediately to survey the dam site and canal, and prepare estimates. The preliminary report of Mr. C. H. Mitchell estimates a working head of 40 feet and the cost of the dam and canal for navigation at $1,000,000.

Rosewood, Man.

At a recent meeting of the Rosewood Telephone Company, it was decided that the line should be completed to Ste. Anne immediately the frost is out of the ground. G. Claydon, manager.

Stellarton, N.S.

The Edgarton Tramway Company, Limited, is reported to have purchased the power plant of the New Glasgow Electric Company and proposes to move the plant from New Glasgow to Stellarton.

Toronto, Ont.

City Engineer Rust has received a letter from the Kearney High Speed Railway

Company, Limited, London, Eng., giving an estimate of the cost of a subway railway system for Toronto. They say that with the Kearney Railway and Kearney single tube systems the cost would probably not exceed $1,000,000 per mile, including complete equipment ready for running.

Vancouver, B.C.
Bonds of the Stave Lake Power Company have been underwritten to the extent of $2,500,000, and the work of completing the station at Stave Lake will be pushed. Power will be delivered in Vancouver and Westminster within eighteen months. This announcement was made recently by William McNeil, secretary of the company. Large Eastern Canadian interests are represented by C. H. Cahan, of Montreal and Halifax.

Victoria, B.C.
There is a likelihood that the city will not make additions to the electric light plant this year as was intended. It was estimated that to provide for additional lights in the city an expenditure of at least $20,000 would have to be made. Rather than do that the council is considering the question of taking from the British Columbia Electric Company sufficient to supply present needs. The electric light committee will investigate and report.

Winnipeg, Man.
Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until April 21st for supply of 10,000 pounds No. 6 B. & S. triple braid weather-proof copper wire. Specifications at office of City Electrician.

AWARDED.

Toronto, Ont.
The Standard Electric Company, Confederation Life Chambers, Toronto, have been awarded the contract for the electrical work in the new dock at York street for the Ontario Dock Company, and for the park lighting and signs in the new west end park being opened by Mr. Morris Wolff. T. H. Mace, manager.

The Temiskaming & Northern Ontario Commission has accepted the tender of the Dominion Wire Manufacturing Company, of Montreal, for 75,000 pounds of hard drawn copper wire, No. 10 gauge, to be used in the building of new telegraph lines.

Vancouver, B.C.
The tender of the Great Northern Aluminum Company, of Montreal, at $45,000, has been accepted by the B. C. Electric Railway Company, for 390 miles of aluminum wire to be used for transmission purposes on the Chilliwack line.

Miscellaneous

Montreal, Que.
Recent building permits include: P. A. Connolly, house containing two dwellings, Marie Ann and St. Christophe streets, $2,000; David A. Lewis, three storey house on Cote des Neiges road, $10,000; P. Martineau, house containing four dwellings, Stadacona and Cuvillier streets, $5,000; Sisters of Jesus and Ste. Marie, house containing four dwellings, Notre Dame street east, $1,500; John Archer, alterations to property on Sherbrooke street east, $1,800; Jules Lacasse, alterations to property on Garnier street, $1,800; Miss M. L. Giguere, alterations to property at 26 Picard Lane, cost, $1,800; J. A. Sigouin, two houses containing four dwellings, La Salle avenue, $3,500; J. Bigras, house containing three dwellings, St. Andre street, cost $2,000; D. Fortin, house containing three dwellings, Joliette street, $2,800; Art Amiot, house containing two dwellings, Alywin street, $1,500; Israel Couture, house containing two dwellings, Ontario street east, $3,000; Dr. Ostiguy, St. Hyacinthe, alterations to property at 255 Sherbrooke street east, $4,000; A. Chartrand, alterations to property, Demontigny street, $6,700; E. P. Ladouceur, house containing three dwellings, Labelle street, $2,500; Arthur Hamel, house containing two dwellings, St. Denis street, $2,500; Dominion Government, Ottawa, Ont., two storey post office structure, on Centre street, $31,600; Geo. Rattelade, four houses containing sixteen dwellings, Papineau avenue, $12,000; A. Gregoire, two houses containing five dwellings, Rivard street, $4,000; H. Brisebois, St. Zotique street, house containing three dwellings, Huntley street, $2,500; Alp. Lamontagne, two houses containing six dwellings, Valois street, $5,000; J. Dube, house containing three dwellings, Valois street, $2,500; A. Chartrand, two houses containing six dwellings on Plessis street, $6,600; Alex. Deschamps, five houses containing fifteen dwellings, Boyer street, $10,000; Rev. A. O. J. Piette, hall, St. Hubert street, $3,000; Alderic Lapointe, Rosemount, house containing two dwellings, 9th avenue, Rosemount, $2,000; H. L. Putnam, alterations to property, Trafalgar avenue, $9,000.

Toronto, Ont.
The Island Committee will ask the City Council to submit to the ratepayers on June 5th a by-law to raise $76,000 for the purchase of a sand pump for use at the Island in connection with Commissioner Wilson's Island improvement scheme.

The Park Commissioner will make a report on the cost of a dipper dredge for Island purposes.

Three Rivers, Que.
Dr. Deblois will erect a new sanitorium. Plans are being prepared by Daoust & Lafond, architects, Three Rivers.

Vancouver, B.C.
Recent building permits include: W. A. Baur, reinforced concrete block, Hastings street, $150,000; Drick Nordman, frame dwelling, Hornby street, $2,000; John Morley, two frame dwellings, York street, $4,000; City of Vancouver, bathing shed, English Bay, $24,600; J. Seabold, brick apartment house, Thurlow street, $20,000; Sam Sing, frame laundry, Nelson street, $2,500; J. Bigerton, frame dwelling, Haro street, $15,000; T. Evans, frame dwelling, Napier street, $6,875.

Winnipeg, Man.
The Board of Works are again considering the question of granting a franchise for a steam plant to W. Skinner.

AWARDED.

Grand Falls, N.B.
One of the largest contracts for cement ever placed in the Dominion of Canada has just been placed by the Frank B. Gilbreth organization with the Vulcan Portland Cement Company, whose works are at Longue Pointe, Quebec. The order covers the entire cement requirements for the Grand Falls work at St. John, N.B., and will amount to nearly 100,000 barrels of cement which will be tested at the company's storage bins, where it will be reserved under seal and shipped in carload lots to the job as required, thus assuring the contractor that the cement will be up to the standard requirements when received.

Lindsay, Ont.
The contract for supplying the town with cement for the year has been awarded to D. Cinnamon at $1.35 per barrel. The price last year was $2.00. The following also tendered: Thorn Cement Company, of Hastings, at $1.30 per barrel, and Joseph Monder, McLennan & Company, J. G. Edwards & Company, Baker Lumber Company and J .Carew, all at $1.50 per barrel.

Montreal, Que.
The Terrano Flooring Company, Limited, have closed the following contracts: Furness Withy S. S. Company, Halifax, decks; Robt. Simpson Company, Toronto; kitchens; Quebec & Levis Ferry Company, Quebec, decks; I. C. R. power house, Moncton, N.B.; Beauport Asylum, Beauport, Que.; Alex. Brillian, druggist, St. Denis street, Montreal.

New Companies

Austin Lumber Company, Limited, Cap St. Ignace, Que., capital $95,000. Incorporators, W. Marler. E. Choledde, B. Hubert and J. E. Lemire, all of Montreal, and H. M. Marler, of Drummondville, Que.

Insulyte Company, Limited, Montreal, Que., incorporated to carry on business as general contractors, and manufacturers and dealers in contractors' supplies, etc., capital $49,000. Incorporators, H. P. Douglass, F. G. O'Grady, W. L. Bond, J. J. Meagher and R. Burnett, all of Montreal.

Art Wall Paper Shop, Limited, Toronto, Ont., incorporated, capital $50,000. Incorporators, T. H. McGee, A. C. Fox, J. H. MacKay and W. W. Fox, sr., all of Toronto.

Belden Sheaf & Hay Loader Company, Limited, Palmerston, Ont., incorporated, capital $50,000. Incorporators, W. L. Holmes and P. Ament, of Brussels, Ont.; G. Howe, Palmerston, Ont.; W. B. Belden, of Grey Township, and W. R. Halpenny, of Listowel, Ont.

St. Lawrence Paper Mills, Limited, Cornwall, Ont., incorporated, capital $150,000. Incorporators, F. V. Johns, G. H. Sedgewick, L. Davis, W. G. Anderson and J. W. Heffernan, all of Toronto.

United Heat, Light & Power Company, Limited, Goderich, Ont., incorporated, capital $100,000. Incorporators, A. W. Glass, W. G. Mackintosh, J. P. Glendon, W. A. Glass and G. W. Willebrank, all of Detroit, Mich.

Dublin Hydraulics, Limited, Dawson, Yukon, incorporated, capital $250,000. Incorporators, L. J. Thompson, A. W. Smith, R. S. Hildebrand, W. E. Thompson and others, all of Dawson city.

Canadian Tungsten Lamp Company, Limited, Hamilton, Ont., incorporated, capital $300,000. Incorporators, P. D. Crerar, T. H. Crerar, W. A. Stewart and others, all of Hamilton.

Rhodes Improved Metallic Packing Company, Limited, Montreal, Que., incorporated to manufacture and deal in electrical, mechanical and hydraulic machinery, etc., capital $20,000. Incorporators, E. A. Barnard, C. L. Austin, J. C. Austin, A. B. Johnston and R. Robillard, all of Montreal.

Dobson & Jackson, builders, Winnipeg, Man., have dissolved partnership.

Recent British Columbia incorporations include Converse-Brown Shingle Company, capital $10,000; Lake Shore Telephone Company, capital $25,000, head office Summerland; Pacific Shingle Company, capital $10,000, incorporated to take over the business of Lamont Bros. in New Westminster; Rupert Haddington Stone Company, capital $25,000, incorporated to take over the Haddington Island Quarry; Vancouver Industrial and Development Company, capital $250,000, incorporated to work quarries and carry on business in silica brick.

Tenders and For Sale Department

Conduit

Tenders for Underground Conduit will be received up till APRIL 30TH, by the City of Toronto, Canada. For specifications and form of tender apply Electrical Department, City Hall. 17

To Architects

The town of Parry Sound contemplates erecting a Town Hall, and would like to correspond with architects with a view to suggestions and sketches. Particulars from

E. E. ARMSTRONG,
Clerk
16

Agents Wanted

A United States firm manufacturing chemical preparations for water purifying etc. is prepared to appoint represenratives in Toronto and other large Canadian cities. Would like to get in touch with good parties who would be in a position to purchase the chemicals, selling on his own account, or some good responsible party who would handle on commission. Correspondence strictly confidential Write Box 722 CONTRACT RECORD, Toronto.

Town of Estevan

Province of Saskatchewan

Tenders Wanted

Sealed tenders will be received by the Secretary-Treasurer until

Wednesday, May 19th,

for constructing a

Water Works System and Main Sewer

comprising 7,300 feet of Water Mains, 2,400 feet of Tile Sewer, also **Steel Water Tower, Gasoline Engines, and Power Pump.**

Plans and specifications may be seen at the office of the Secretary-Treasurer, Estevan, or of the Chief Engineer, 103 Bay Street, Toronto, on and after April 22nd.

No tender necessarily accepted.

L. A. DUNCAN. Esq.
Secretary-Treasurer,
Estevan, Sask.

WILLIS CHIPMAN, C. E.
Chief Engineer,
103 Bay St., Toronto, Ont.

16-18

Tenders Wanted

City of Saskatoon

Sealed tenders addressed to the undersigned will be received until 5 o'clock p.m., WEDNESDAY, APRIL THE 28TH, 1909, for the following:

(a) One Brick, Steel or Concrete Smoke Stack with a height of 100 feet and inside diameter of 66 inches, together with corresponding smoke connection to boilers.

(b) Bricking in 2-250 Horse Power Robb Mumford water tube boilers.

Plans and specifications may be seen at the office of the Electrical Superintendent.

A marked cheque for $100.00 must accompany tender.

The lowest or any tender not necessarily accepted.

E. L. WHITE,
Electrical Superintendent

J. H. TRUSDALE,
City Clerk.

16

Debentures for Sale

Tenders will be received by the undersigned up to SATURDAY, THE FIFTEENTH DAY OF MAY, A.D., 1909, for the purchase of Eleven Thousand ($11,000.00) worth of Debentures of the town of Durham bearing interest at the rate of 4½ per cent per year, running for a period of twenty years. Interest and principal payable in equal instalments of $845.64.

WM. B. VOLLET, Clerk,
Town of Durham.
17

Debentures for Sale

Seven Thousand Dollars, 15 years, 4½% Public School Debentures, municipality of Port Colborne, Ontario. Fifteen equal instalments, interest and principal payable annually Dated May 15, 1909. Please submit offers to

J. T. HUGHES,
Village Treasurer,
Port Colborne.
17

Wanted

Names of Electrical Firms who are prepared to take up the manufacture of an electrical device requiring light machinery. Correspondence confidential.

Box 718
Contract Record, Toronto

17

Water Filtration Plant

Notice to Contractors

Tenders will be received by registered post only addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on MAY 18TH, 1909 for the SUPPLY OF MATERIAL AND THE CONSTRUCTION OF THE NECESSARY WORKS IN CONNECTION WITH A WATER FILTRATION PLANT for the city of Toronto.

Envelopes containg tenders must be plainly marked on the outside as to contents.

Specifications and plans may be seen, and forms of tender obtained, at the office of the City Engineer, City Hall Toronto,

The usual conditions relating to tendering as prescribed by city bye-laws, must be strictly complied with, or the tenders will not be entertained.

The lowest or any tender not necessarily accepted.

JOSEPH OLIVER (Mayor),
Chairman Board of Control.

City Hall, Toronto. April 16th, 1909. 17

Tenders

Sealed tenders will be received up to WEDNESDAY. MAY 12TH, 1909, by the undersigned for erection of an English Church in the Village of Burks Falls, Ont., where plans and specifications may be seen and information obtained.

The lowest or any tender not necessarily accepted.

REV'D CANNON ALLMAN,
Burks Falls, Ont.

April 20th, 1909. 17

Positions Wanted or Vacant

WANTED. Man to operate and take charge of Sawyer-Massey stone crusher; on Lanark County good roads; must be steady and understand his business. Apply to J. K. MCILQUHAM, Lanark P.O., Ont. 16

WANTED STRUCTURAL DRAUGHTSMEN for steel bridge and building work. Apply by letter to Chief Draughtsman, Dominion Bridge Co., Limited. Montreal. 16

ELECTRIC AND STATIONARY ENGINEER wishes a position; good on wiring and fitting, repair and care of motors; 18 years' experience; references; Ontario Papers. Box 728, Toronto. 17

Miscellaneous

SECOND-HAND SET TINSMITH'S TOOLS.—in good condition, for sale. Apply Box 97, Walkerton. 16

WANTED—To correspond with Canadian Firms who are legitimate jobbers of electrical material, who do no contracting or sell electric current, by a manufacturer, with a view of establishing agencies in Canada for Standard Electrical Specialties paying a very liberal margin. Box 726, CONTRACT RECORD, Toronto. 17

ELECTRIC SIGNS.—A firm manufacturing up-to-date signs are open to appoint selling agents. Would like to get in touch with aggressive and reliable firms or individuals who would push this line either all over Canada or in sections to be arranged Correspondence confidential. Box 724, CONTRACT RECORD, Toronto. 18

The length and cuts for a cripple jack can be found just the same as for a jack resting against a hip. The cuts of the cripple are the same at both ends and are identical with that for the upper end of a jack resting against a hip. Where the roof is all of the same pitch, the runs of the hips and valley will rest parallel with each other. Now here is a point that a great many do not catch onto, and that is—the run of the cripple jack is the same as the length of the plates that form the angle. Thus, the length of the plate on one side is 6 feet, and on the other it is 10 feet, which represent the respective runs of the jacks. However, it should be remembered that this measurement is from centre to centre of hip and valley; and it is therefore necessary to make a deduction in the run equal to the thickness of the hip, or valley; or the length of the cripple may be found for the full run, and then measure square back from the plumb cut the full thickness of the hip, which will be at the proper point for the plumb cut.

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Vol. 23 Toronto, April 21, 1909 No. 16

Greater Detail for Ornamental Requirements

One needs only to look at the present style of our public buildings or to glance at the interior plan of the average residence to be impressed with the fact that the ornamental side has become a big factor in our modern architecture. The nature of the design and the quality of material used in exterior and interior decorations lend character to the general appearance of an otherwise bare and prosaic structure. Every bit of ornament either serves to enhance or detract from the particular part in which it is placed, and thereby either beautifies or mars the whole structural background. It is important, therefore, that such decorative effects be not only of the true and proper materials but that they should also be artistically proportioned and completed.

In the preparation of their plans very few architects make adequate provision for this very important feature of present day building. Tenders are usually let in a very general way. Those trades employed in excavation, masonry, bricklaying and carpentry receive specific plans and can determine to a fair degree of accuracy what is required of them. The finer workman, such as the wood-carver, is not always so favored. It is true that work like his is of a secondary and subsidiary nature, but it is very essential to the perfect completion of the building, that it be well done. For, after all, it is the master hand of the more skilled workman that supplies the finishing touches and presents the edifice to its owner in a presentable and habitable condition.

After the architect has provided for the erection of the foundation and superstructure and for the completion of the interior plan, attention is given to ornamentation. As a rule, drawings made on an absurdly small scale are furnished and from these the carver is supposed to get his bearings and make quotations. His tender is made under a certain misrepresentation of the real contract, and, if it is accepted, misunderstanding invariably arises before the work is completed. Occasionally, models are cast in plaster of paris for the guidance of the workman and this method in every case proves highly satisfactory. The actual size of the ornament and the extent of the carving are fairly represented and there is no such liability to subsequent alteration and increased expense as when a small scale plan is used. If every architect would follow this rule of securing models of the decorative carving that is to be done by hand, results would be more satisfactory to all persons concerned. Fairness would be given to the man who at present undertakes the contract and finds his work subject to interruption in the form of numerous alterations; satisfaction would rest with the client, upon whom the final burden of cost descends, and, in the last analysis, benefit, through the advantages of the others, would certainly accrue to the architect himself.

Many elements enter into the letting of a building contract, which tend to reduce it to a very narrow margin for the contractor and which very often encourage an inferior quality of workmanship. If the more explicit direction from the architect in this one department with which we have been dealing would in any way lessen the evils of keen competition in the contracting business, that effect alone would justify the adoption of such a policy by the architectural profession of Canada.

The Advance in Brick

Incidental to the commencement of building operations and to the unprecedented demand created by the long list of structures contemplated this season, there has come a rise in the price of brick. In Toronto, the price of red brick has gone up a dollar a thousand, making the price ten dollars a thousand for delivery to the centre of the city. Other kinds of brick, with the exception of pressed brick, have also been increased in price.

Builders are inclined to resent this and to lean to the opinion that the brick manufacturers, with a record season in prospect, are holding them up.

The brick makers, on the other hand, declare that they have no intention of taking any advantage. They point out that as the clay beds around the city are used up, they are compelled to go farther out for their material, and the cost of haulage becomes greater.

Be this as it may, it must be admitted that, after all, it is only the long-expected that has happened. Coupled with the advice to build given by the *Contract Record* in the dull times when materials were cheap, was a warning that such favorable conditions could have no permanence, and this prediction is now being verified. It is interesting to note that during the year of the big Toronto fire the brick of the grade that now cost $10 sold for $11 a thousand.

Personal Mention

Mr. Frank Barber, County Engineer for York County, has been appointed township engineer for King Township.

City Engineer Rust, Toronto, returned last week from Cape May, N.J., where he has been staying for his health.

J. Z. Resther, Montreal, vice-president of the Architectural Institute of Canada, has been elected an alderman for the city of Montreal.

Mr. W. H. Shillinglaw, former City Engineer of Brandon, Man., leaves shortly for a six months' visit to Europe, where he will make a study of modern municipal engineering problems.

Mr. A. B. Speakman, formerly City Engineer of Calgary, has been appointed City Engineer of Brandon at a salary of $2,250 a year, vice Mr. W. H. Shillinglaw, resigned. Mr. J. R. Heddle, formerly assistant city engineer at Hamilton, Ont., declined the offer of this post.

Mr. E. P. Featherstonhaugh, B.Sc., honor graduate of McGill University and a member of the Canadian Society of Engineers, has been appointed lecturer in electrical engineering to Manitoba University, his appointment taking effect in July. For some time Mr. Featherstonhaugh has been associated with the Canadian Westinghouse Company at Winnipeg.

Mr. Richard Wallace, late superintendent of the Buffalo Structural Steel Company, has been appointed superintendent of the new bridge shop of the Manitoba Bridge & Iron Works, Limited, Winnipeg. Mr. Wallace has had a wide experience as superintendent in several of the large American shops in the manufacture of railway bridges and steel structures, and will no doubt be an important factor in developing this business at Winnipeg.

Obituary

A veteran contractor of Belleville, Ont., recently passed away in the person of Mr. Thos. Luscombe. The deceased gentleman was a member of the city council and was held in high esteem. His career was a varied one. He was born in England and rendered service in the Crimea war. Mr. Luscombe was seventy-five years of age.

Mr. A. J. Brown, an old-time Toronto contractor, recently died at Syracuse, N.Y. Mr. Brown came to Toronto from Syracuse when a young man and embarked in the contracting business at a time when the city was installing its sewer system. For many years he devoted himself to this branch of the work and constructed the large sewers here and at Niagara Falls. Later he broadened into general contracting and his latest large contract was the large chemistry and mining building for the University on College street at the head of McCaul street.

Mr. Claude de B. Leprohon, Deputy City Surveyor of Montreal, died last week after an illness of three months. Mr. Leprohon was born in 1857 and was educated at St. Mary's College, afterwards taking the science course at McGill University. In 1876, he was appointed leveller on the engineering staff chosen by the Federal Government to survey the work of enlargement on the Lachine canal, and held this post until the completion of this work in 1885. The following year he was entrusted, as assistant engineer, with the inspection for the protection of the city against inundation. He was appointed to his civic position in 1892. Mr. Leprohon had been a member of the Dominion Civil Engineers' Society since 1889. He was formerly honorary secretary of the Montreal Engineers' Association.

White in Interior Decoration

Several discussions have taken place recently as to the desirability or otherwise of an extensive use of white in interior decoration.

From the point of view of an old painter, I think this "craze" has been a bad thing for the future race of craftsmen. Even though it has made "painters" of a sort, what skill is there in painting a room in white? Very little, and the sooner we go back to color the better. True, in the tinting of a cornice, for instance, many schemes were carried out in the worst possible taste; but as time went on men improved. Under the "all white" system there is no chance to learn.

How many of our younger hands to-day, or, indeed, many of those who are middle-aged, could successfully put in a cornice in colors, make recessed parts still further recede, bring into still greater prominence the mouldings, and, by the aid of color, cause a room to look considerably higher, or, if necessary, make it appear lower? Very few indeed, and wholly and solely through such an extensive use of white. I am inclined to believe that this fashion must have been introduced by some man who was color blind, and the sooner we go back to even the "old-fashioned" system of tinting the better.

It has been said that the man who can draw a human figure can draw anything; and, let me add, the man who can harmonize the tints on a deep cornice can tint anything else—and in correct good taste.—Exchange.

Painting Tin Roofs

The attention of property owners is directed to the wisdom of keeping tin roofs well painted. To those who are unfamiliar with such matters invaluable advice can be obtained from the average roofer who possesses reliable information as to the character of paint needed to properly protect exposed metal work. In this connection it has been argued that invariably where roofs, gutters, eaves troughs and such equipment are to be painted there is necessary also the services of an expert workman to make needed repairs before the painting is done, remarks "Waterproofing and Fireproofing."

Work of this character quite properly falls to the expert roofer, and is unquestionably not the province of the all around mechanic. If a jack-of-all-trades is to be allowed to attend to your painting, endeavor at least to furnish him with roofing paint of quality. There is little want of evidence that some of the paints frequently used on such work instead of being a protection from the elements act as a live agent of destruction to the best sheet metal made. Good paint and good workmanship should go hand in hand, especially where roofs are concerned.

Great Falls, Mont., has the distinction of having the highest concrete smokestack in the world, even though the work was done by a German firm. The stack is 506 feet in height, and weighs 34,000,000 pounds, or 17.000 tons. It rests on a concrete foundation 25 feet deep and 103 feet in diameter. The diameter of the stack at the base is 78 feet 6 inches, and at the top 58 feet. The stack is also claimed to be the largest piece of concrete masonry of any kind every constructed.

Toronto Society of Architects' Fifth Exhibition

The fifth exhibition of the Toronto Society of Architects which was brought to a close on Saturday of last week was one of the most successful events of its kind which have ever been held in Toronto. During the eleven days of the exhibition there was a splendid attendance and the interest taken by the public in the development of Canadian architecture was very encouraging to the society. It is not stretching the point at all, to say that the exhibition afforded much reason to congratulate the architects of Toronto upon the advance which they have recently made in the development of their art. They are beyond a doubt reaching out for higher ideals, and many of these ideals are to-day much nearer attainment than they were a few years ago.

There has risen in Toronto recently—and in this regard Toronto is typical of the rest of Canada—a striving for greater things, which augurs well for the future of the art. At an exhibition of architects' work one used to expect to find plain, ugly residences or unreasonably ornate ones, and unsightly office and public buildings, predominating among those portrayed. To-day there is a noticeable difference. One cannot avoid the conviction that Toronto architects have reached a stage of development where they are enabled by their experience and by the force of the good example set by those who have been pioneers in the matter, to design structures which are excellently adapted for their economic purposes and are also fitting ornaments to the locality in which they are to be erected. For many years in the past Toronto's architecture ran woefully to ugly utility, and inasmuch as it caused the erection of thousands of eyesores, the utility which was made so great a goal was lessened by the inability of the buildings to please the eye. There was a time in the early days of Toronto when it was quite otherwise and when many a delightful house was erected. Public taste has been changing recently and to-day there is again an appreciable demand for houses as well as office and public buildings which will be an asset to the public as well as to the owner. This is the healthiest condition which architecture can experience, and, thanks to the Toronto Society of Architects, and to other similar bodies, the architects of the country are rising to meet the demand. In fact, it was amply demonstrated by the exhibition which has just closed, that they are stepping out in advance of the public movement, and doing much to direct and develop it along sane, reasonable and successful lines.

During the exhibition there were several entertainment features, some of which were mentioned in a previous issue of the *Contract Record*, which added greatly to its interest. The most important of these was an enjoyable smoking concert given on Thursday night of last week, which was attended not only by many architects, but also by a large number of representatives of other artistic and literary bodies. The concert was carried out with splendid success and reflected great credit upon those who were in charge of it. The entertainment committee consisted of Messrs. Vaux Chadwick, Sandford F. Smith, Charles E. Langley and Howard Bovell.

Toronto Architects' Smoker—Members of the profession in a lighter vein.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

399. Manufacturers' agents.—A well known firm of wholesale hardware dealers are open to represent Canadian manufacturers of engineering specialties, hardware, etc.

402. Railway rolling stock.—A Scottish firm manufacturing railway rolling stock requirements in bar iron wishes to get in touch with Canadian buyers.

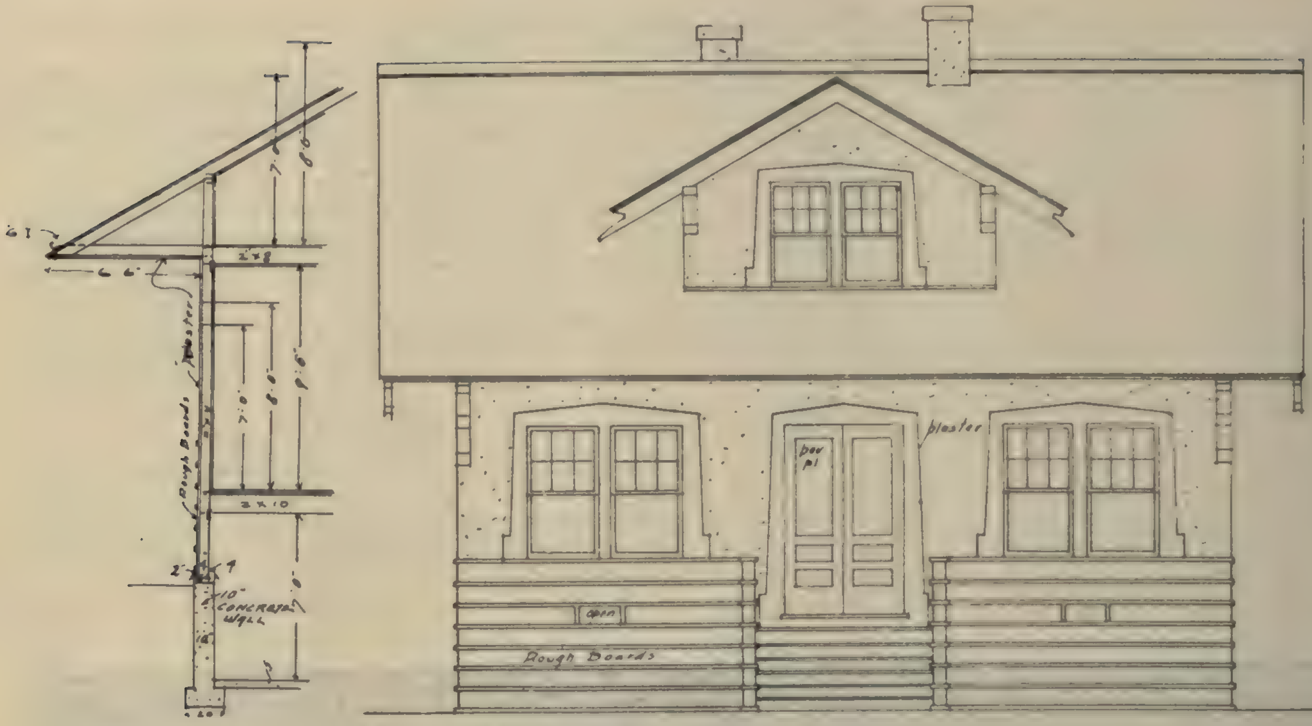
403. Representation.—A Manchester firm wishes to secure the representation of some Canadian manufacturers of machinery and engineering materials.

404. Representation.—A north of England firm is prepared to investigate any engineering problems for Canadian manufacturers; also to purchase for, inspect during construction, and test when necessary all classes of machinery, engineering material and supplies.

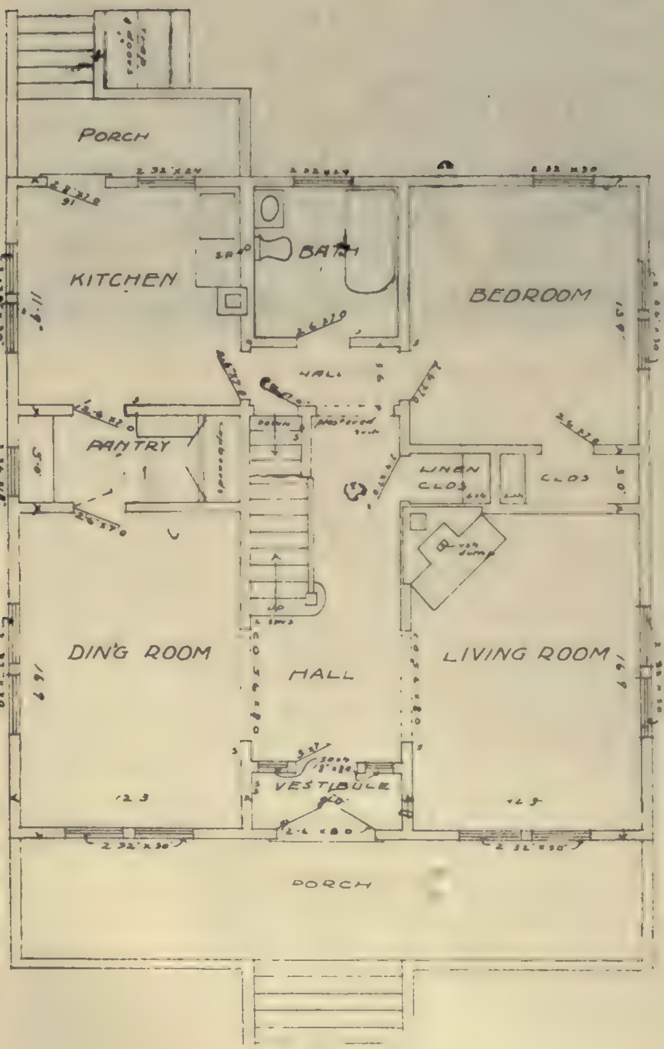
406. Agent.—A London firm manufacturing motor cars, launches, marine engines, industrial plant, etc., wishes to appoint an agent at Vancouver, B.C.

408. Representatives.—A Lancashire firm manufacturing boiler scale preventative wishes to appoint representatives in Canada.

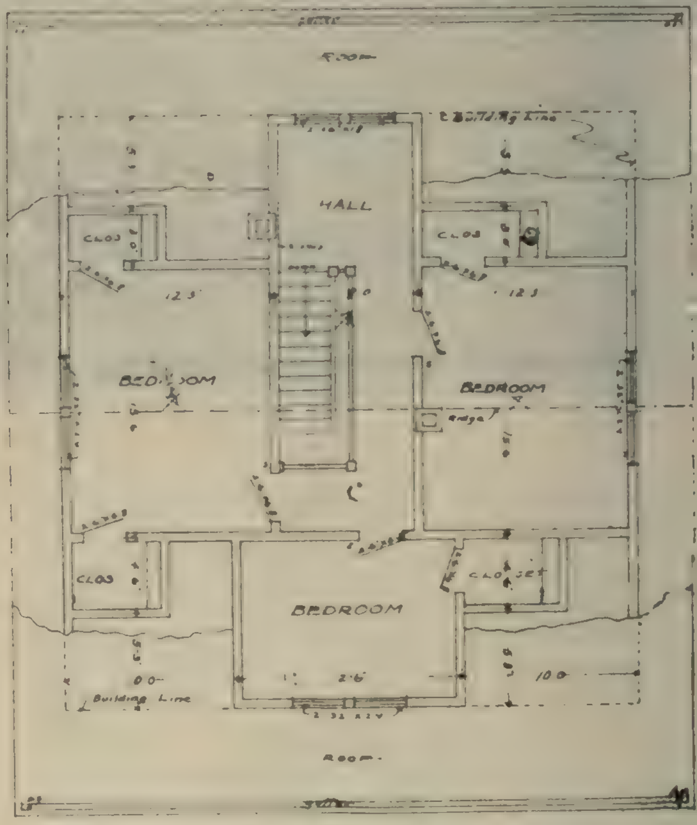
415. Machinery.—A Yorkshire firm manufacturing a machine for automatically firing boiler furnaces with small coal ("slack") wishes to open up a business connection in Canada.



Plaster House—Front Elevation.



First Floor Plan.



Second Floor Plan.

The design shown above is a suggestion by "Cement World" for a plaster house of seven rooms. A wide hallway extends from the front door to the rear, connecting with another that joins the kitchen and a bed room and a bath room. Ample closet room is provided in the plan. The intending home builder should be interested in studying these plans. No estimate of the cost is provided, but it is apparent that the dwelling has been designed with primary regard to economy and general utility.

April 21, 1909

How Many Pieces of Lumber in a House?

Analysis Shows that 50,000 are Required in the Average $2,500 Structure

It is a fact that very few people, contractors and carpenters included, have any adequate idea of the number of pieces of lumber required to build an ordinary house costing about $2,500. Of course, it is impossible to make a complete piece bill for a house of this size, even if one familiar with the work should spend a great deal of time upon the task, but an estimated number can be arrived at which will serve as well for the purpose of general information or diversion.

The contractor will make his lumber bill for dimension and have 160 pieces for joists, including porches; 280 pieces for studding; 60 pieces for rafters; 80 pieces for plates; 20 pieces for trimmers.

This would make the total number of dimension pieces on the bill 600, and according to common practice and the best economy of cutting, the number of pieces resulting from these and used in the house would be not less than 900. The joists would nearly all be used in one piece, but the rafters, inside studding and porch dimension would be cut up to the amount indicated.

To continue with the bill, we would have: 4,000 feet shiplap, 500 pieces; 20,000 shingles, 20,000 pieces; 15,000 lath, 18,000 pieces; 1,500 feet of siding, 2,250 pieces; 5,000 feet flooring, 1,400 pieces; 600 feet ceiling, 200 pieces; 1,000 feet outside finish, 200 pieces.

Leaving the outside dimension part of the work, we come to the mill work, which is much more receptive in regard to number of pieces than is the part already mentioned. For instance, an ordinary wondow, with its frame and inside finish, is made up of about 50 pieces, as follows: 8 pieces sash; 5 pieces jambs, including pocket pieces; 1 piece sill; 1 piece sub-sill; 3 pieces outside casing; 1 piece cap; 3 pieces moulding, including returns; 9 pieces stops, including blind, parting and ogee; 1 piece stool; 1 piece apron; 1 piece fillet; 3 pieces casing; 3 pieces cap, including returns; 3 pieces mould, including returns; 1 piece mould under stool; total, 44 pieces. And as part of the windows are marginal light style, the total number of pieces to the opening would average to 50, and so the 20 windows and frames complete would require 1,000 pieces of finished lumber.

Of course, no account is taken of the great number of small waste pieces of wood made in the construction of the building, but only of those utilized in the actual putting together of the work.

A door and frame complete require somewhat less of an outlay in variety of pieces, but the number is deceivingly large, after all: 3 pieces jambs; 2 pieces outside casing; 3 pieces moulding; 1 piece cap; 1 piece sill; 1 piece threshold; 3 pieces stops; 3 pieces inside casing; 2 pieces base of plinth blocks; 1 piece fillet; 3 pieces cap; 3 pieces moulding; 12 pieces in outside door; total, 39 pieces, in outside door and frame. As three of the four outside doors have an extra panel, the total number of pieces would be 160.

Each inside door and frame will aggregate 42 pieces, and as there are 15 inside doors in this house, there will be 630 pieces in this item.

The base, base shoe, base mould and picture moulding will make up 300 pieces more, while the stairs will require 400 pieces, including newels, balustrade and glue wedges.

The columns and pedestals will take up 150 pieces, the panel work 250, kitchen and pantry cupboards 300, china closet 150, closets, shelves and wardrobe, 200.

The outside mouldings, with all their mitres and returns, will require 200 pieces. The porch columns and balustrades will take up 1,000 pieces more, as the columns are staved up and the caps and bases mitred together out of four pieces to each member.

Footing up the total number of pieces indicated, we have the significant sum of 45,440 pieces of lumber in a moderate sized house with plain exterior and interior finish. It would be an easy matter to increase the number of pieces by 1,000 to 1,500 without increasing the size of the house, depending upon the intricacy of detail. For instance, a dental cornice on a good-sized house might require the 1,000 pieces in that item alone, so that it would be safe to say that a $2,500 house would require between 45,000 and 50,000 pieces of wood to complete it.

Another significant fact in regard to the pieces in a house is that, with the exception of some of the lath and shingles, every piece has to be trimmed to length from one or both ends, and many of them two or three times before they are left to occupy their permanent position in the building. Many of them are sized in width one or more times, and all are sized to some thickness or other. Some of them are planed one side and some two, while many are resurfaced and sand-papered, scraped and polished.

It is also a curious fact that one thoroughly familiar with mill work and building construction could sort out the various pieces that go to make up a house if the whole were piled together promiscuously. If he were to take sufficient time he could sort out the pieces of flooring, siding, sheathing, lath, etc., for each particular space of surface, supposing that they had been cut and fitted but not nailed up. He could find the pieces for the windows, even to the little bars that go to make up the marginal lights, even if they were mixed up with the thousands of lath and shingles. He could sort out the stuff for doors, panel-work, china closets and cupboards, the staves and many parts which go to make up the colonades, pedestals and newels. In short, he could fit the house together like a box of blocks, provided it had been got out according to a fixed plan and set of details.

While the statement that a house contains 50,000 separate pieces of wood does not necessarily convey the idea of the practical number, one can imagine what would be the result of mixing the whole up in the same heap, the smallest pieces of windows and doors alongside of the heaviest joists and the smallest corners of shingle with the longest rafters.

The fellow who shirks his work in this world, and is the last to be on the job in the morning, is generally the first to be at the pay wicket on pay day and has the least to show for his labor. He doesn't live, he simply exists. He has no usefulness, and when he dies he is soon forgotten.

The architect for the house at Milton, Ont., illustrated in the *Contract Record* in the issue of April 7th, was Mr. Alexander G. Macrae, 90 Yonge street, Toronto. This information was inadvertently omitted.

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Gravity Heating for a Residence

What is a proper installation for a warm air furnace, asks "An Old Timer" in the "Architect and Engineer." To answer this question, he continues, we will have to generalize somewhat to begin with, and perhaps may say some things that will not set well with some that think they know, and, in what is said, we do not want it to be understood that the writer is an absolute authority on the subject, but a student, who has received many a jolt, and wishes to pass them on to others, in order that they, too, may profit. Remember that you cannot do a good deed for your neighbor unless it is returned to you by natural law, therefore, if what can be said in these articles results in better work, so much the better for all of us, and the prestige of the warm air furnace, as a means of comfort in our homes.

The architect has prepared plans for a residence, and to it he has applied his best knowledge. The exterior may command the admiration of the beholder, the interior may be a dream in its beauty, everything in connection with its finish may be of the best that thought and money may procure. By means of catalogues containing illustrations and examples, which are accurate and exact, the architect has been educated to the point where he can select and specify what is fitting, or out of his knowledge he can design a stairway, a color scheme or any special part that is needed to make up the structure into a beautiful whole until it comes to the heating. Unfortunately, this seems to be the last consideration, and again the manufacturers of warm air furnaces have never furnished the architect any reliable data on which to base calculations for heating, if he were disposed to treat the subject as it deserves. So on the whole it is not fair to blame the architect only, but the manufacturer as well, for his neglect of an important part of the building.

Following this comes the dealer in warm air furnaces, who, in a majority of cases, is quite ignorant of the heating subject, but as long as he is able to make the price he gets the business independent of knowledge on the question. The result is obvious. Some one is going to get stung. Now, then, an architect is calling for bids for a residence; everything except the heating is plainly called for and specified, even to detail and catalogue number, and here is where the poor furnace man gets his; there is usually a round spot on the basement plan to indicate the position of furnace, and perhaps there are marks in the different rooms showing locations of warm air outlets; then the specifications will say that the furnace shall be of sufficient size or capacity to heat the building to 70 degrees in the coldest weather, etc. Bids are received and opened—one man wants $350 for a job and specifies clearly what he will furnish—the evident intention of the proposal being a first-class installation. Another bid will be for $225, and, of course, the architect wonders where the difference can come in, as both firms are supposed to be equally responsible financially for any undertaking they propose. Now, the reason for the architect's indecision is this—he has never investigated either one of the proposer's goods, or his method of installation, consequently, he is in no position to judge, and unless he is disposed to be of an investigating frame of mind, he awards the contract to the lowest man, and, in case that he does, we grant that he usually gets a job that will heat the house. So will a ⅛-inch stream of water fill a barrel if you only give it time, but we all know that a 1-inch stream will fill the barrel more quickly. A warm air furnace heats by filling the space to be heated with warm air; also any means of heating costs money every time you use it, therefore, it is a reasonable supposition, that the furnace which has a capacity to warm a house in twenty minutes is preferable to one that takes an hour to do the same work. And this is the meat of the whole matter—to try and get a fair investigation of the warm air furnace, first by the architect, for we know that he wants to give his client the best; second, by the owner, who owes it to his own purse and to the comfort of his family to secure the best, and lastly, both the manufacturer and the dealer to learn their business well enough to be able to give information that is real information and not guess work. When they do this, then will the architect and owner begin to have respect for what they offer.

Heating Equipment for Factories

A proper factory-heating equipment has come to be recognized as being just as important to the welfare of the institution as a proper equipment of machines and other appliances for carrying out the work. Keeping the factory comfortable facilitates work just like modern machines and there is not much room left for argument on the question of whether or not it pays to keep the factory comfortable.

The place for argument these days is on methods of equipment. There are a number of methods for heating factories and different appliances offered. Those which have their origin from heat in the power plant of the factory may be divided into two classes: hot blast and steam. Some prefer one and some the other, and the relative efficiency of either seems to depend considerably on how well it is designed and carried out. Either will give good satisfaction if properly installed in the plant.

The advocates of the hot-blast system maintain that it furnishes a means of ventilation both winter and summer as the fans for the heating in the winter can be made to furnish cool air and fresh air in the summer. There are various methods of installing the hot-blast system. Some remind one considerably of the hot air heating system in a dwelling and others have large leads emptying into the big rooms of the factory from overhead.

The point to keep in mind when one uses a hot-blast system is that it is an advantage to have the fan driven independently of the machinery of the factory proper. If it is not, if it is simply driven when the machinery is going, it leaves the factory cold until starting time in the morning and then it takes it some little time to warm up. Again, when the factory is shut down at the noon hour the hot blast stops and sometimes in severely cold weather the building gets uncomfortably cool before starting time. For this reason it is better to have an independent drive for the hot-blast fan which may either be a small engine or an electric motor if electric transmission is used.

This is one place where electric transmission should come in nicely as the fan could be stopped and started at will, but if there is no electricity to drive it except when the main engine is going to furnish electricity for driving the factory there is practically the same trouble as when it is directly connected to the main shafting of the factory. It will probably be better to have it driven either with a direct-connected light engine or have an auxiliary engine to make electricity for lighting purposes and for driving the hot-blast fan.

The point to be kept in mind is that of having the factory comfortable at all hours regardless of whether or not the machinery is running. It should be so that even if it is not kept up all night the fan can be started say an hour before work time in the morning and drive out all the frosty air and have the place comfortable by the time the machinery starts.

With the steam radiator system of operating, the heating system is, of course, independent of everything except the boiler plant. So the night watchman or fireman who comes in the morning can turn in heat and have the factory warm whether the machinery is running or not; and if it is desired the factory or any part of it can be kept warm all night. One thing to be kept in mind in laying out the details of a steam heating system is to have the different departments of the factory so that they can be regulated independent of each other. Otherwise if the heat goes from inside the boiler room on through the others in succession with one main lead and return there is likely to be too much heat in part of the factory and not enough in another, and it causes more or less discomfort and trouble. So each floor or each department should be piped separately and under separate control. Then the men in each department can keep the temperature in there just what they want or, if it is desired, shut off one department and keep some other one warm either during the day or night, for it is easily done.

With some of the smaller plants the problem of heating has of late years assumed a little different aspect because of using either gasoline engines or electric power purchased from the outside. This leaves the plant without any boiler to draw on for heat either by hot blast or steam pipes. As this boiler plant is a source of heat in practically all the larger factories its absence in the smaller ones where gasoline engines and electric drives are used may seem to complicate matters. It is, however, both practical and comparatively easy to install independent heating systems.

There has been wonderful progress made since the great demand for heating systems for dwellings in the making of independent heating outfits and many of those used for dwellings are equally adaptable for small factories. Of these there are three classes: the furnace or hot air, the hot water, and steam.

All of them can, by proper arrangement, be made to utilize waste material in factories for fuel. Frequently, however, it is better to sell the waste material for kindling or for various other purposes and use coal, because coal is a more durable fuel and requires less attention. One may obtain a type of furnace to heat whatever space is required and lay out the system in pretty much the same manner as is done for dwellings. One can get a hot-water heating system of the dwelling type also or take a small steam boiler and equip a steam heating system independent. By putting the steam boiler down in the basement or low enough down in an adjoining building to get a return drain from the heating system direct into the boiler there is a saving in that the condensed water from the heating coils or radiators can return into the boiler and very little additional water is required during the day. For heating purposes it is necessary to carry but a few pounds of steam.

Some prefer to take the same independent boiler, put in a hot-blast fan and coils in the boiler room with a direct-connected engine and keep steam enough in the boiler to run a regular hot-blast system the same as in factories which have their regulation boiler equipment. This can be done too, but it costs a little more to install than the lower pressure systems and generally, for small plants which have no power plant of their own to draw on for heat it would seem advisable to modify and adapt to general use some of the various systems made and sold to-day for heating dwellings.

Failure of Dam for Electric Power

A dam on the Missouri River, known as the Hauser Lake dam, and built for the purpose of supplying water for generating electric power, gave way a short time ago. The dam, which was constructed of steel, was 630 feet in length and 70 feet in height. It was built up of steel bents, upon which were carried curved steel plates, forming the water-face of the dam. The dam was supported at each end on solid rock, but for about 400 feet in the centre had a gravel foundation. At the upstream toe it was anchored to Freistedt sheet piling driven into the hard river bed. Under the plates and down stream from the sheet piling was a rubble masonry fill. The failure commenced at a point about 400 feet from the east end of the dam, at which end the power house is situated. The way in which the failure took place was apparently owing to the joint between the steel face plates and the sheet piling giving way and thus allowing water to pass through under the masonry fill. The gravel upon which this rested was rapidly washed away, causing the masonry, together with the lower end of the girder forming the upper member of the steel bent, to settle down. The result of this was that the joints between this girder and the plates at the top of the masonry also failed, leaving the bents and plates unsupported, so that the water was able to push them over. About six minutes after the water came through under the masonry the first part of the dam fell—a section of about 30 feet in length. After this gap had been made the foundations were rapidly undermined, and bents continued to fail until the width of the breach reached nearly 300 feet. The cost of the total damage is estimated at $37,500, not including that to the dam, and the only reason that this moderate figure was not exceeded is due to the favorable nature of the river below the dam.

He was a twentieth century hustling builder. and under its auspices cottages and buildings seemed to spring up like mushrooms.

"Please, sir," said one of his foremen, rushing up to him one morning in a state of mental collapse, "one o' the new houses has fallen down in the night."

"What!" he roared. "You mean to say that one of my well-built, desirable residential houses has come to grief? Ah, I suppose you took the scaffolding down before you put on the wall paper?"

"Yes, sir."

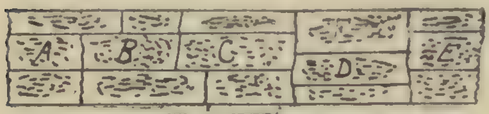
"Well, what can you expect, you rank outsider? Call yourself a foreman! Get off the works! You're sacked!"

Lessons from Experience for Stone Masons

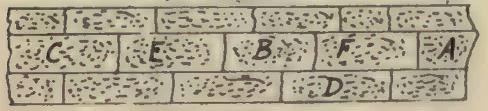
Perhaps there is no other trade connected with building in which book knowledge is at such a discount and practical experience at such a premium as that of the stone mason, says John Upton in the "National Builder." Yet there are many instances when a little knowledge and theory may well be mixed with the actual experience as a mason. This applies more particularly to beginners, though often the experienced man may learn some useful things by reading.

The simplest form of foundation is piers or butments placed on top of the ground at greater or less distances apart. It is possible to do either good or poor work in even this simple operation.

If necessary to place one stone on top of another one should so place the lower stone that a level, flat surface is on top. Yet we often see large stones used for this purpose and placed with the flat side down and a rounded side at the top.



poor construction



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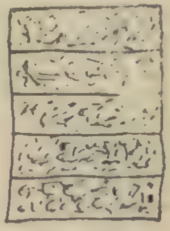
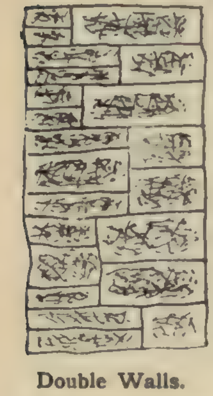
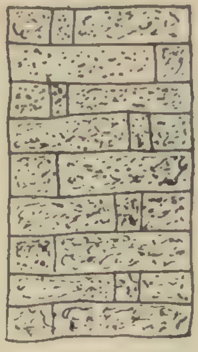
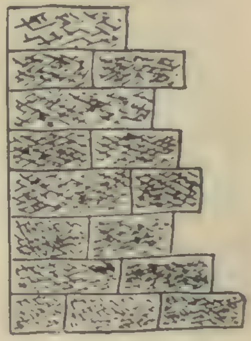

angle wall


Double Walls.


Vertical Sections.


Bridge Wall.

These piers or butments should have their faces in the same relation to the sill resting upon them as they would have if built into a wall; that is, they should be inside of a line dropped from the sill rather than outside of such a line. At least the top stone of each pier should be so placed, for if allowed to project beyond the sill there is a place for water to collect, and in time rot the sill.

Right here let me give you a hint in regard to handling large stones. Use one or more planks and some pieces of iron pipe two inches in diameter and two feet long for rollers. By their help one or two men can move a large stone.

The simplest sort of a foundation wall is known as a single wall. In this stones of almost any size and shape are placed one above another so as to form a wall with one side fairly straight and even. Such a wall as this, simple as it is, requires the use of good judgment to make the best use of the material at hand. It is a long-established rule that all stones should lie on their natural bed.

No two joints should be allowed to come so that one is directly above the other; that is, in the next course above it, but each stone should overlap and bind on to two beneath it.

In the two illustrations, marked good construction and poor construction, the same stones are shown in different positions. Notice the difference in the walls. In the first the joints come directly over each other; in the second they do not. This applies to all classes of walls.

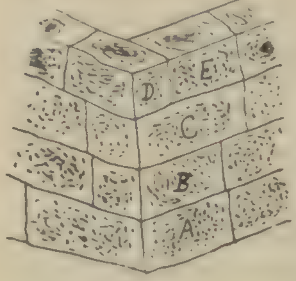
Another point where poor workmanship is sometimes seen is at the corners of walls. Here the mason may not break joints or may not get the two walls well bound together.

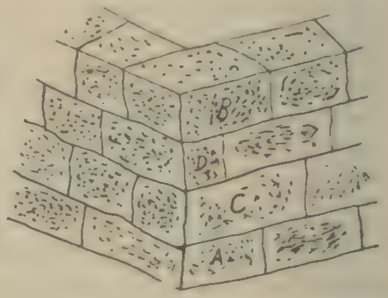
In the illustration shown there are good stones, yet, because they are not rightly placed, the work is not good.

Notice B. It is a good stone, but does not break joints on the right. The same with C on the left. D is all right, but E and C do not break joints.

In the illustration shown of a good corner there are the same stones, but they are laid differently.

So far we have considered only the face of the wall, but a wall may be built of good stones and have a good face, yet be a poor wall. When we consider the vertical section of walls we find that we may have a single or double wall. A single wall is one in which the stones reach through from one face to the other. In a double wall these stones are smaller and do not reach entirely through. The single wall is all right for foundations and for partition walls, but for cellar walls which are to be frost-proof it will not answer, since it does not give sufficient protection, and so the double wall is commonly used.





In building a double wall some of the stones should be more than half as wide as the wall and some of the courses should be less than half this width; for instance, for a two-foot wall stones 15 inches wide and those 8 inches wide will work well together. Leave a space between and bind well.

In building double walls the stones for both faces are not always the same thickness. Stones 6 or 8 inches thick may be used for the one side and 3 or 4 inch stones for the other side. The only requirement being that two or more courses of the thinner ones shall be equal to one or two of the thicker ones.

Another type of wall is commonly known as the bridge wall, from being used as foundations for bridges; another the work is faced on only one side, the other side being left in almost any shape that the stones happen to come. In this kind of wall a large portion of the stones should be headers; that is, should be placed with their length across the wall.

One accustomed to laying straight walls might be somewhat puzzled when he desired to build a wall having part or all of its face curved or containing angles other than right angles. It is no more difficult to lay a curved

(Continued on Page 38)

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wall (as for a round silo) than it is to lay a straight wall with square corners. The first thing is to find the centre of the circle, or part of circle, then fix a stake at this centre and drive a nail in the exact centre. Take a board, bore a hole near one end, place this hole over the nail and on this board mark where the face of the wall should come. This board may be moved around on the nail and must be kept level. To build an angle one should use a template, made from a piece of board cut to the required angle. Use this template as a guide in dressing the stone. One will soon find that stones can be dressed to a curved or an angular face as readily as to a straight one.

A wall should generally have a footing course somewhat wider than the main part of the wall. This may project out on both sides or only on one side of the wall, and may consist of a single row of large stones or may be composed of two rows. In case suitable stones for this footing can not readily be obtained it can be made of concrete. Frequently, instead of a footing course being built the wall is made wider at the bottom than at the top. This is known as a battered wall.

Of course, the character of the work and of the wall will depend largely on the character of the stones available for use. It must be expected that in a land as extensive as ours there will be a great variety of stone; some good, some poor.

Failure of a Cofferdam

The recent failure of a cofferdam at the Vittoria Dock, Birkenhead, England, on March 3rd, has attracted much attention from the engineers and contractors of that country because exceptional care was used in the work, and the nature of the accident was unusual. To reach the new dock it was necessary to cut away part of the wall of an old dock, and the cofferdam was built around this place. There were two rows of heavy pitch pine sheet piling 5 feet apart, the intervening space being filled with clay puddle. The sheet piles were driven through 12 feet of silt and about 9 feet into hard material below it. This depth was as great as could be reached with a 2-ton hammer. The space behind the cofferdam was dry, and the old wall was taken out without difficulty, the cofferdam being braced back against the wall or the earth behind the latter. At the time of the accident a timber platform on which the old wall had rested was being removed, when the bottom rose suddenly, causing a heavy loss of life. The violence of the upward rush of earth and water is shown by the fact that a man who was working at the bottom of the excavation was tossed up some 40 feet to the ground surface, where he managed to save himself when the cofferdam fell in.

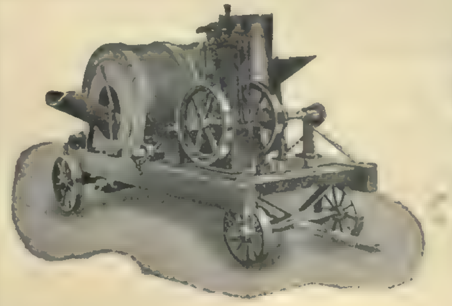
Design of Hollow Tile Houses

While it may not be worth the attention of the hollow tile manufacturers as a financial proposition, it seems that a campaign of education should be conducted in the design and construction of hollow tile houses. The public have already been impressed with the artistic possibilities of plaster cast walls, and the comparative cheapness and mobility of the hollow tile material, aside from its permanent and fire resisting quality, would appeal to the architect and owner if the construction could be accomplished without extra trouble. The wooden house is largely built to-day because everyone knows more or less about its construction, and workmen who can do the work are most easily secured. The main difficulty in the erection of a hollow tile house is to find workmen who can use the material to advantage. This, of course, will change with the increase in this class of construction, but not as rapidly as it would if either the manufacturers or the public societies that are interested in the general comfort and economic advancement of the people, should erect sample structures in every city as an object lesson, with cost schedules and other information that could be absorbed by workmen and public alike. It is time that the construction of hollow tile houses should pass from the amateur to the professional stage.—Western Architect.

An Ingenious Lumber Elevator

In many mills where there is machinery on an upper floor, the matter of getting lumber upstairs is often one of manual labor, and to get around that part of it a mill man I know devised a roller elevator that, for simplicity and rapidity, has anything else of the sort beat to a standstill. The upper floor is fourteen feet high and it was quite a job to shove stuff up that high, so a frame was suspended from the ceiling, about half-way between the upper and lower floors, and on the bottom of this frame a power-driven roll was placed, over which was suspended a loose roll for a pressure roll. The end of a board was placed between the two, and in line with the box leading through the floor, and the board was rapidly run up to the upper floor, right into the hands of the man above and close behind the machine for which it was intended, or else on a truck, if it was to be removed to some remote machine. This unloaded the waggons rapidly, saved one handling and did not let the load touch the ground, and one of the mill hands suggested this little trick.—Exchange.

To the cement man: Don't forget to mix thoroughly before sending the material to the kilns. Indifferent mixing makes weak cement.



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I KNOW it's pretty hard to make some folks believe a new thing is better than what they've been used to—a Pedlar Culvert, for instance, than concrete or wood or whatnot. But I feel pretty sure that you will SEE it is, if you will just look into the question fairly and squarely before you undertake any more culvert construction, or road improvement, or ditching. Don't judge this NEW culvert by anything you've heard about other culverts. MINE IS DIFFERENT—a whole lot different, and a whole lot ahead of any other. Write to my people and make them show you why and how. We're making this in all standard diameters, from 8 inches up to 6 feet, so your wants can probably be supplied. Write and ask questions anyhow.

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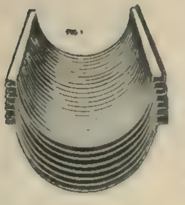
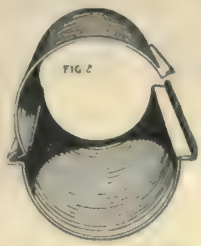
The peculiar Pedlar flange, or locking-rib, along the whole length of each side of these Culverts, clamps together easily and most rigidly. There are no bolts, no rivets, no lock-nuts of any kind,—simply clamp the edges of the flanges together, making a triple thickness of inter-sealed heavy metal along the sides of the pipe (read below here how this is quickly done) and you have a Culvert that is enormously strong, tight, and not only leak-proof but strain and rust and frost-proof, the rib allowing for expansion and contraction. You cannot appreciate the value and the simplicity of this until you have seen the culvert itself. It is the easiest culvert to put together, and it is better when put together. It is the most portable. It costs less per linear foot to ship by freight, and a whole lot less to haul,—it nests, that's why, of course. And it will serve any culvert use better.

Made of Best Heavy Billet Iron

Galvanized AFTER Being Shaped



When the sections of Pedlar Culvert, of any diameter—it's made from 8 inches to 6 feet—reach you, they are nested like Fig. 1. Note the two distinct flanges—the radial and the recurved. These fit into each other, and are FLAT, while the CURVE of the culvert is corrugated. Place section on top of section, and the flanges, or locking-ribs, engage easily, as you see in Fig. 2. The joints between one length and another are "broken"—no over-lap reaches more than half-way round the culvert's diameter; and this is possible with NO OTHER metal culvert made. It is a most valuable feature, for it reduces the chance of leakage to the very least minimum.



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Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Belleville, Ont.

At a recent meeting of the City Council, City Engineer Lindsay presented his report upon the proposed sewerage system. Total estimated cost, $50,000.

Carman, Man.

The ratepayers will vote upon a bylaw to raise $25,000 by debentures for the completion of the town waterworks system.

Guelph, Ont.

Some changes will be made in connection with the plans for the aerial beds which are to be constructed this summer to complete the disposal plant.

Kamloops, B.C.

The ratepayers will vote on a bylaw to raise $5,000 for sewerage purposes.

Lethbridge, Alta.

The city is calling for tenders for a steam pumping equipment to deliver 3,000,000 gallons per twenty-four hours.

Moose Jaw, Sask.

A bylaw for $20,500, to provide for the construction of concrete and plank or wood walks and pavements, will shortly be voted on.

Montreal, Que.

At a recent meeting of the Roads Committee, it was resolved to ask for funds for building a city asphalt plant in the western part of the city.

Mayor Turcot and Councillors Berube and Neville, of the St. Louis Council, have been appointed to confer with Westmount with a view to obtaining a filtration of the water service.

Tenders will be received until April 28th for the furnishing and erection of an asphalt paving plant for the City of Montreal. Forms of tender and all information may be obtained at the office of the City Surveyor, City Hall. L. O. David, City Clerk.

The bylaw providing for the installation of a high pressure water supply in the west ward for fire protection purposes has been ratified at Quebec. The plans for the system are complete. They call for a pumping station on the Place Royale, with a 20-inch suction pipe running a sufficient distance into the basin to provide and assure the necessary pressure. From Craig to St. Peter, and from Craig to St. Francois Xavier, and from these streets to McGill street, 16-inch force pipes will be used. On McGill, Craig, St. James, Notre Dame, St. Paul and Common streets, 10-inch pipes will be used. Work will begin with the least necessary delay.

Oak Bay, B.C.

The bylaw to raise $50,000 for the installation of a water distribution system has been withdrawn for revision.

Oshawa, Ont.

At a recent meeting of Council the report of the town engineer was adopted for the construction of twenty-four granolithic sidewalks, aggregating 13,210 feet, at a total cost of $7,057.

The town engineer has been instructed to prepare plans and estimates for the extension of out-fall sewers.

Picton, Ont.

Tenders addressed to William McQueen, City Clerk, will be received until June 2nd for supply of water pipe to the city. Specifications on application.

A bylaw to raise $10,000 to build sidewalks and streets in the village of Bloomfield has been approved by the ratepayers.

Prince Rupert, B.C.

E. A. Wilmot, the dyking engineer of the Provincial Government, is here to report upon the water supply.

Peterborough, Ont.

Engineer Kennedy is engaged on plans for new waterworks dam for the water commissioners.

Prince Albert, Sask.

The Council are making good progress with their paving projects. $4,000 has been added to the estimates for the paving of Central avenue. It has been decided to macadamize the principal streets in the centre of the city and to purchase the necessary road making machinery, for which $8,000 has been included in the estimates. About $65,000 in all has been placed in the estimates for work to be done this year. The paving will be done by debenture and bylaws will be submitted.

St. Thomas, Ont.

Tenders addressed to J. A. Bell, City Engineer, will be received until April 30th for necessary artificial stone sidewalks, curbing and gutter to be constructed during the current year. Plans and specifications on application.

Victoria, B.C.

The Streets Committee have recommended that the city engineer be authorized to obtain the necessary equipment for the rock crusher, and that the purchasing agent be authorized to purchase two new, double team, water sprinklers.

A bylaw for a $50,000 additional loan, for sewer purposes, will be submitted to the ratepayers, together with several paving bylaws now pending.

Wingham, Ont.

The Council is dealing with the question of pure water and a test well will be sunk before the question is submitted to the ratepayers, as to whether they approve of spending several thousand dollars in securing a supply of pure water for domestic purposes.

Welland, Ont.

Tenders addressed to W. H. Crowther, Mayor, will be received until May 1st for the purchase of $44,242 debentures issued for construction of sewers and concrete walks. J. H. Burgar, Town Treasurer.

Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until May 1st for full width asphalt pavement on Dufferin street, from Main to Parr streets. Plans and specifications at office of City Engineer Ruttan.

Tenders are invited by the city for grading, curbing and construction of asphalt pavements. (See advertisement.)

AWARDED.

Calgary, Alta.

Bithulithic & Contracting, Limited, Winnipeg, has been awarded a contract for 45,000 square yards of bithulithic pavement by the City of Calgary. The same company was recently awarded by the City of Edmonton contracts for this year's paving amounting to approximately $115,000.

Halifax, N.S.

Tenders for city supplies for 1909-10 were recently opened by the Board of Works. Particulars are as follows: Brass stop cocks—W. Stairs, Son & Morrow, $1 for half-inch, $1.05 for three-quarter; McAvity & Son, St. John, 90 cents for half-inch and 94 cents for three-quarter; Canadian Brass Company, 60 and 85 cents. Latter recommended for acceptance. Granite—Tenders were received from the Kline Granite Company, A. W. Yeadon and Amos Yeadon and the latter's being the lowest was recommended. Drain pipe — Brookfield Bros., 500 feet 9-inch crock at 18 cents per foot, recommended for acceptance. Cement — 500,000 pounds. — Tenders from Sydney Cement Company, W. Stairs, Son & Morrow, Melvin & Company, Eastern Portland Cement Company, and Brookfield Bros. The tender of Brookfield Bros., at 43 3-4 cents per 100 pounds, being the lowest was recommended for acceptance.

Inverness, N.S.

Debentures amounting to $15,000, issued for waterworks purposes, have been awarded to G. A. Stimson & Company, Toronto.

Lindsay, Ont.

Tenders for supplying the commissioners with galvanized iron pipe were received from D. Cinnamon, McLennan & Company, Morrison Bros., Boxall & Matthie, and J. Hungerford. The tender of the McLennan Company was accepted, which was as follows: 5,000 feet 1-4 inch, $3.45 per 100 feet; 500 feet 3-4 inch, $4.35 per 100 feet; 200 feet 1 1-4 inch, $8.30 per 100 feet; 300 feet 2 inch, $13.20 per 100 feet.

Montreal, Que.

The Southern Counties Railway Company have awarded to Stack & Brogan the contract for paving Common and Mill streets and the approaches to Black's bridge.

MacLeod, Alta.

The contract for the supply of sewer pipe to the town has been awarded to the Ontario Sewer Pipe Company, Limited.

Oak Bay, B.C.

Debentures amounting to $50,000, issued for waterworks purposes, and $20,000 for local improvements, have been awarded to G. A. Stimson & Company, Toronto.

Peterborough, Ont.

The Board of Works will divide the contract for supply of castings, etc., for 1909 between G. Walter Green & Company, Limited, and the Wm. Hamilton Company, of Peterborough, as the prices were the same. Sewer pipes for 1909 will be purchased from the Ontario Sewer Pipe Company, of Mimico, Ont., at a couple of cents per foot less than was paid last year. This tender was 6 cents per foot f.o.b. Mimico. The Hamilton Sewer Pipe Company tendered at 6 9-10 cents per foot, f.o.b. Hamilton.

St. Catharines, Ont.

Of the following tenders submitted to the city for street paving the acceptance of the tender of T. Riley for brick pavement and of Blight & Fielder, of Chatham, for asphalt block is recommended: Warren Bituminous Company, Toronto, bithulic, $79,129.82; sheet asphalt, $74,236.56. R. Secord, Brantford, westrumite, $64,804.98. T. Riley, St. Catharines, Johnsonburg brick $76,464.58; Mack brick, $78,874.50. D. W. Mitchell Construction Company, Niagara Falls, Ont., Conneaut block, $74,468.05; Johnsonburg brick, $78,083.42; Mack brick, $82,672.02; asphalt block, $92,591.16; westrumite, $70,755.44. Louis Gipp, Buffalo, Bessemer brick, $80,997.40. Elliott & Riley, St. Catharines, westrumite, $71,430.60. Blight & Fielder, Chatham, asphalt block, $81,887.22. Newman Bros., St. Catharines, Penn brick, $72,982.04; Johnsonburg brick, $77,500.64; Mack brick, $79,910.56; asphalt block, $85,426.60.

Victoria, B.C.

At a recent meeting of the City Council, tenders were opened for sprinkling apparatus as follows: Brayshaw's Carriage Works for two sprinklers, steel tanks, $650; wooden tanks, $600. John Meston, steel tanks, $625; wooden tanks, $565. Mussens Limited, Montreal and Vancouver, $566. The tenders were referred to the engineer and purchasing agent for report.

Waterloo, Ont.

Tenders submitted to the Council for the construction of cement walks for the year 1909, were as follows: Paul Bergman, cement walks, 9 1-2 cents per square foot; driveway, 11 cents per square foot; street crossings, 12 1-2 cents per square foot; extra filling, 55 cents per cubic yard. Ed. Dermul, cement walks, 9 cents per square foot; driveways, 10 cents per square foot; street crossings, 12 cents per square foot; extra filling, 50 cents per cubic yard. The contract was awarded to Mr. Dermul.

Railroads, Bridges and Wharves

Aylmer, Ont.

The proposed $10,000 wharf will not be constructed this season. There are indications that the scheme will be brought up again next year.

Chipman, N.B.

Tenders addressed to John Morrissy, Chief Commissioner, Department of Public Works, Fredericton, will be received until May 10th for the construction of concrete sub-structure and approaches of the Chipman bridge. Plans may be seen at the office of Ritchie & Hardaker, Chipman, N.B., at the office of Hon. Robert Maxwell, St. John, N.B., and at the Department at Fredericton.

Edmonton, Alta.

It is stated that the C. P. R. will at once commence the construction of a high-level bridge between Edmonton and Strathcona.

The Canadian Northern is preparing to undertake the active construction of a line into Camrose and Calgary this season. Lines will run from Vegreville south, and another branch will be built from Camrose into Strathcona. The company will also penetrate the northern wilds, and expects to have trains running into Athabasca Landing within a year. Surveyors are now actively at work in the field.

Fort Frances, Ont.

The C. N. R. contemplate the rebuilding of bridges and relaying of tracks east of Fort Frances this season.

Guelph, Ont.

Two bridges will be built this year. The materials have not yet been decided upon. Tenders will be called for shortly. A number of culverts will also be constructed.

Kingston, Ont.

The Grand Trunk Railway is making preparations to relay the double track between Brockville and Kingston with 100 pound rails.

London, Ont.

County Engineer Talbot is busy on several bridge plans for the Middlesex county council.

New Carlisle, Que.

Tenders will be received until May 21st for steel superstructures of bridges and trestles, fourteen in number, of a total length of 4,900 feet, to be erected on the Atlantic, Quebec & Western Railway in the district of Gaspe, Quebec Province. Tenders are to be sent in duplicate, one copy addressed to the New Canadian Company, Limited, New Carlisle, Que., and the other to the Chairman, New Canadian Company, Limited, Queen Anne's Chambers, Broadway, Westminster, London, England. Plans and specifications and full information may be obtained on application to the company at New Carlisle, Que.

New Westminster, B.C.

Tenders are called for by the Provincial Engineer's Department for the painting of the New Westminster bridge. Tenders are to be sent to the Minister of Works, and must be in by May 3rd.

Ottawa, Ont.

Tenders addressed to L. K. Jones, Secretary, Department of Railways and Canals, will be received until May 31st for work required in connection with the abutments and approaches of the new bridge below the waste weir at Kingston Mills Lock Station on the Rideau Canal. Plans and sections can be seen and specifications and forms of tender obtained at office of superintending engineer, Canadian Building, Slater street, Ottawa.

The Canadian Northern Quebec Railway Company will apply to Parliament for authority to construct a line of railway from a point at or near Hedleyville to a point on the Montmorency river.

The Arnprior & Pontiac Railway Company has obtained a charter to build a line of railway from Quyon to Fitzroy Harbor. The company is empowered to build a bridge across the Ottawa river near Chats Falls.

Sudbury, Ont.

The Canadian Northern Ontario Railway Company are applying for authority to construct a line from Sudbury to Little Current. G. F. MacDonnell, Toronto, is solicitor for the company.

Stratford, Ont.

A proposal is on foot to cover with a cement arch, Romeo creek, which runs through the business and part of the residential section of this city. Cost of work is estimated at $12,000.

Winnipeg, Man.

Edson J. Chamberlain, general manager of the Grand Trunk Pacific Railroad, states that construction will shortly begin on the branch lines north and south from Melville, Sask. The company will lose no time in building a through line from the American boundary to Hudson Bay.

It is stated that a bridge will be constructed over Colony Creek on Grey street by the Assiniboia Council. Councillor Ballantyne has the matter in hand.

The ratepayers will vote on a bylaw for the erection of a new Loiuse bridge over the Red river, a new bridge on Main street over the Assiniboine river, and an overhead bridge connecting Brown and Brant streets. Estimated cost, $400,000.

AWARDED.

Guelph, Ont.

Eight tenders were received for erecting the new steel bridge over the River Speed at Armstrong's Mills. The contract was awarded to the Hamilton Bridge Works Company.

Winnipeg, Man.

The contracts for the erection of the National Transcontinental Railway bridge across the Red river at Winnipeg have been awarded to Haney, Quinlan & Robertson, for the substructure, and to the Dominion Bridge Company for the superstructure. The contract price for the former is $265,000, and for the latter, $240,000.

Public Buildings, Churches, Schools, etc.

Belleville, Ont.

The County Council will expend about $30,000 on an addition to the court house.

Brandon, Man.

A new theatre will be erected here by W. F. Gillman.

S. Hooper, provincial architect, Winnipeg, is preparing plans for a large addition to the Brandon asylum to be built this year.

Brantford, Ont.

Taylor & Taylor, architects, this city, are preparing plans for alterations to the Park Baptist Church. Estimated cost, $10,000. Tenders will be called about May 20th.

Brussels, Ont.

Ireland & Killer, architects, Stratford, Ont., are preparing plans for a stone and brick library to be erected here at a cost of $6,500.

Chilliwack, B.C.

Construction will start at once upon a new parish hall for St. Thomas Anglican Church.

Calgary, Alta.

The ratepayers have defeated bylaws providing for an extension to the city hall and for the erection of a central fire hall and three sub-stations.

Dunnville, Ont.

Tenders addressed to Munro & Mead, architects, Chancery Chambers, Hamilton, will be received until May 12th for the erection of a House of Refuge at this place for Haldimand County. Plans may be seen at H. Smith's drug store, Dunnville, county clerk's office, Cayuga, and at the office of the architects, Hamilton.

Edmonton, Alta.

It is stated that the C. P. R. will commence the construction of a station and hotel on Ninth street.

Tenders are about to be called for the new high school.

Estevan, Sask.

The ratepayers will be asked to vote on a bylaw to raise $23,000 for the erection of an eight-room school building, according to plans perpared by Architect Zimmerman.

Fort William, Ont.

Plans are to be prepared at once for the enlargement of the Auditorium Theatre at a cost of $12,000. A bylaw to raise this amount will be submitted to the ratepayers.

Galt, Ont.

The ratepayers will vote on May 1st on a bylaw to raise $20,000 for the enlargement of the Galt hospital.

Goderich, Ont.

The Public School Board invite plans until May 20th for an eight-room brick school. Alex. Saunders, Chairman, Public School Board; H. W. Ball, Secretary.

Hamilton, Ont.

The Wesley Methodist Church will be enlarged.

The congregation of Zion Tabernacle have inaugurated a fund to raise money for the erection of a new Sunday school.

All Saints' Church has appointed a building committee to report upon a scheme for enlarging the church at an estimated cost of $14,500, the greater part of which amount has already been subscribed.

Halifax, N.S.

Tenders addressed to C. J. Desbarats, Acting Deputy Minister of Marine and Fisheries, will be received until May 10th for the construction of a wooden lighthouse tower on McNeil Beach, Boularderie Island. Plans and specifications may be obtained at the Department at Ottawa, at the agency of the Department in this city, and at the post offices at Baddeck, N.S., and North Sydney, N.S.

Kincardine, Ont.

Tenders addressed to A. McKinnon, secretary-treasurer, Glammis P. O., will be received until May 14th for erection of brick schoolhouse.

Kamloops, B.C.

The ratepayers will be asked to vote on a bylaw to raise $25,000 for a new city hall. If the measure carires construction will be started this season.

Kingston, Ont.

Extensive improvements and additions to the Kingston Penitentiary will be made during the next two years.

Lachute, Que.

Tenders for fittings, Lachute Post Office, will be received until May 7th. Napoleon Tessier, Secretary, Department of Public Works, Ottawa.

Lindsay, Ont.

Tenders are called by Victoria County for installation of heating system for certain buildings and for improvements to Registry Office. (See advertisement.)

Montreal, Que.

Tenders will be received until May 10th for the construction of an annex to the Jacques Cartier Normal School. Plans and specifications may be seen at the Government Offices, No. 9 St. James street, Montreal; also, at offices of Mr. R. A. Brassard, architect, Quebec, and Alphonse Gagnon, Secretary, Department of Public Works and Labor, Quebec.

Work will shortly commence on the new armory for the 65th Regiment. Estimated cost, $100,000.

The St. Louis council are asking the C. P. R. to build a new depot at Mile End.

The Montreal Jockey Club will shortly commence the erection of a new building.

Maple Creek, Sask.

Tenders for fittings for public buildings close at this place on May 7th with N. Tessier, Secretary, of Public Works, Ottawa. Specifications with J. Reid, Clerk of Works, Maple Creek.

Marnoch, Ont.

Tenders addressed to W. Robinson, Marnoch, Ont., will be received until May 1st for repairing Donnybrook Methodist Church. Plans at residence of S. Thompson, Donnybrook.

Manitowaning, Ont.

Tenders addressed to J. D. McLean, Secretary, Department of Indian Affairs, Ottawa, will be received until May 8th for the erection of a frame school on stone foundation at Wekwemikongsing, Manitoulin Island. Plans and specifications at office of C. L. Sims, Indian Agent, Manitowaning.

Neepawa, Man.

Tenders for fittings for public buildings at this place close May 7th with N. Tessier, Secretary, Department of Public Works, Ottawa. Specifications with J. Reid, Clerk of Works, Maple Creek.

Ottawa, Ont.

Tenders are being called for the erection of a new convent for the Sisters of the Sacred Heart. No contract has yet been awarded.

Tenders are about to be taken for the new consumptive home to be built by the Anti-Tuberculosis Society. Weeks & Keefer, architects.

Picton, Ont.

The congregation of St. Mary Magdelene contemplate the erection of a new church at a cost of $20,000.

Portage la Prairie, Man.

W. F. Gillman, formerly manager of the Grand Opera House, Winnipeg, is interested in a scheme for the erection of a theatre in this town.

Peterborough, Ont.

The Property Comimttee have accepted the plans of Belcher & Blackwell for the new public library. Specifications will be prepared at once. Estimated cost, $25,000.

Port Arthur, Ont.

J. D. Matheson, of Warren & Wetmore, architect, New York, has plans for a $200,000 C. N. R. depot to be erected in this city.

Rimouski, Que.

Tenders will be invited about the beginning of May for the construction of a stone and brick convent, estimated to cost $50,000, for the Grey Nuns, of Quebec. Architects, Ouellet & Levesque, 115 St. John street, Quebec.

Selkirk, Man.

Plans are being prepared by the provincial architect, S. Hooper, Winnipeg, for an addition to the asylum.

Toronto, Ont.

John M. Lyle, architect, this city, has prepared draft plans for the new Central Prison. No informaton is yet to hand regarding the site.

The Board of Education want tenders for several trades in erection of new school on Avenue road. (See advertisement.)

Debentures will be issued to raise $80,000 for the completion of the Kent school.

The C. P. R. have submitted to the city plans for the viaduct calling for a total expenditure of $8,000,000.

Dr. Howard, of Boston, and Dr. Holmes, of Cincinatti, were recently in the city consulting with Darling & Pearson, architects, 2 Leader Lane, in regard to the plans for the new General Hospital.

The House of Industry contemplates the enlargement of the Wayfarers' Lodge.

Vancouver, B.C.

J. W. Considine, of Seattle, plans the erection of a large vaudeville theatre in this city.

Victoria, B.C.

The James' Bay Athletic Association will probably commence, at an early date, the construction of a new $75,000 building.

Weston, Man.

The Swimming Bath Association have purchased a site for a new building.

Wharncliffe, Ont.

Tenders addressed to A. E. Mercer, Wharncliffe, Ont., will be received until May 8th for erection of new school at No. 3, Wells.

Welland, Ont.

The ratepayers will vote on May 17th on a bylaw to raise $10,000 for additional school accommodation.

Weston, Man.

A bylaw to raise $23,000 for the erection and equipment of a fire hall will be submitted to the ratepayers.

Winnipeg, Man.

The Salvation Army contemplate the enlargement of Grace Hospital at a cost of $30,000.

A new ten or twelve roomed school is to be erected on the Aberdeen site, corner of Salter and Stella. Plans and specifications are now under way.

The construction of the Ninette Sanitorium will be undertaken this season. Plans have nearly been completed by W. H. Shillinglaw, architect, Brandon.

The rural municipality of Assiniboia will spend $5,000 on improvements to the St. James' school.

T. Smith, architect, 43 Canada Life Block, is preparing plans for the River Heights clubhouse to cost $5,000.

A joint stock company has been formed at Weston for the erection of a public hall and swimming bath. H. E. Penny is president.

A permit has been issued to the School Board for the erection of the La Verandrye school. Estimated cost, $80,000. Saul & Irish, contractors; J. B. Mitchell, architect.

AWARDED.

Brantford, Ont.

Schultz Bros. Company, Limited, have been awarded the contract for the alterations and additions to the Brant County courthouse. Estimated cost, $6,000. Architects, Taylor & Taylor, Brantford.

The contract for erection of school building, S. S. No. 18, Brant County, has been awarded to James Wright. Approximate cost, $3,800. Architects, Taylor & Taylor, Brantford.

Englehart, Ont.
Debentures amounting to $5,000, issued for construction of public school, have been awarded to G. A. Stimson & Company, Toronto.

Moose Jaw, Sask.
The tender for the construction of the new fire hall has been awarded to Navin Bros., Moose Jaw, the price being $19,000. The other tenderers were the Brandon Construction Company, Limited, $18,403; S. A. Covert, Moose Jaw, $21,000; Healey & McGregor, Sault Ste. Marie, $24,375; Smith Bros., and Wilson, Regina, $19,800, and E. E. Poole, Moose Jaw, $21,480.

Stratford, Ont.
Contracts have recently been awarded for the new public school to be erected in this city at a cost of $15,000. Ireland & Killer, architects.

New Hamburg, Ont.
The contract for the erection of the new Baptist church has been awarded to A. Wunder, Berlin, Ont.

Waterloo, Ont.
The Public School Board have awarded tenders for a new brick school building as follows: Aug. May, Berlin, mason work, $5,495; Reitzel Bros., carpenter work, $4,840; Liphardt Bros., plumbing, $1,620; Kroetsch & Boppre, painting, $304; The Metal Shingle & Siding Company, metallic ceiling, $225; Liphardt Bros., tinwork, $94.

Residences

Brantford, Ont.
Taylor & Taylor, architects, this city, will take tenders about May 1st for the erection of a brick and stone residence and barn on Nelson street for Mr. W. Long. Estimated cost, $4,500. The same architects will take tenders about the same date for alterations to residence of Mr. G. E. Cook at a cost of $2,000.

Collingwood, Ont.
Frank E. Brown has plans for a brick house which he will erect this season at the corner of Third and Maple streets at a cost of $30,000.

W. T. Toner and Mr. M. Campbell will build dwellings this season at cost of $2,400 and $2,000 respectively.

Hanover, Ont.
Tenders addressed to H. H. Miller will be received until May 6th for construction of Methodist parsonage. Plans may be seen at Clark's drug store.

Hamilton, Ont.
Herbert H. New, architect, 608 Spectator Building, is preparing plans for a residence to be erected in this city for J. Orr Callaghan at an estimated cost of $3,500. Materials: red brick and shingles.

Moncton, N.B.
Tenders addressed to W. McDonald, Sr., will be received until May 20th for masonry, carpentry and plastering required in the erection of a residence. Plans at owner's residence at Rossburn.

Ottawa, Ont.
Recent building permits include: Mrs. Pageau, brick veneer shops, Murray street, $15,000; Harry Hayley, cement dwelling, Blackburn avenue, $2,000; A. E. Shaver, brick veneer row, Percy street, $4,500; A. E. Shaver, brick veneer row, Second avenue, $6,000; V. V. Rogers, two brick veneer dwellings, Woodlawn avenue, $2,800; V. V. Rogers, two brick veneer dwellings, Regent street, $6,200; R. W. Hamilton, brick veneer double dwelling, Nelson street, $3,000; R. D. Edey, brick veneer dwelling, Wilton Crescent, $3,100; J. R. Cameron, brick veneer dwelling, Clarey avenue, $2,800; V. V. Rogers, brick veneer dwelling, Center street, $2,800; Jas. Langley, double brick dwelling, Woodlawn avenue, $5,000; K. E. M. Currie, brick dwelling, Rideau Terrace, $4,000; F. H. Gilchrist, double brick veneered dwelling, on Fairmont avenue, $3,500.

Peterborough, Ont.
Recent building permits include: S. J. Stubbs, brick veneer dwelling, Dennistoun avenue, $2,500; L. Christopher, brick dwelling, Marguerette avenue, $2,200.

Stratford, Ont.
Ireland & Killer, architects, this city, are preparing plans for a verandah for R. S. Robertson. Estimated cost, $500.

Ireland & Killer, architects, this city, will take tenders up to May 1st for the erection of a stone and brick residence for Mr. F. Nash. Cost, $2,500.

St. Boniface, Man.
P. Gevaert, of this place, will erect a $10,000 stone and brick apartment house.

Toronto, Ont.
Tenders addressed to Darling & Pearson, 2 Leader Lane, will be received until April 29th for all trades in the erection of a house on Admiral road.

Mr. J. C. Eaton, president of the T. Eaton Company, Limited, will erect a $65,000 structure at the corner of Davenport road and Spadina road.

Recent building permits include: George Phillips, three attached brick dwellings, Major street, $9,000; F. W. Hill, two detached two and a half storey brick dwellings, Bowden avenue, $6,500; V. Bryce, pair two and a half storey brick dwellings, corner Poplar Plains road and St. Clair avenue, $7,000; H. Freeman, pair two storey brick dwellings, Ossington avenue, $4,000; Frank Rosar, two storey brick coach house, Shuter street, $3,000; A. Suddaby, brick dwelling, corner Indian road and Howard Park, $4,000; A. N. Garrett, brick dwelling, Maple avenue, $5,500; Dr. A. Hamilton, pair two storey and attic brick dwellings, Howard Park avenue, $6,000; G. Martin, pair two storey brick dwellings, Margueretta street, $4,000; Point Anne Quarries, Limited, one storey galvanized iron storage bin, foot of West Market street, $7,000; Mrs. J. J. Scott, pair semi-detached two and a half storey brick dwellings, Shaw street, $5,000; Agnew Bros., pair semi-detached brick dwellings, Victor avenue, $4,000; A. MacGregor, pair semi-detached two and a half storey brick dwellings, St. Clarens avenue, $5,000; F. T. Burgess, one storey brick theatre, and a three storey brick store and dwelling, corner Lewis and Queen streets, $15,000; D. A. Dunlap, two storey brick garage, rear of 10 Pelham place, $3,000; F. Hanson, pair semi-detached two and a half storey roughcast dwellings, Fenwick avenue, $4,000; T. Ransom, pair semi-detached two storey brick dwellings, Marguerretta street, $4,000; Arthur A. Brown, pair brick dwellings, De Lisle street, $7,000; George Tambling, three attached roughcast dwellings. brick fronts, Hampton, $3,600; Chas. Neale, three attached brick dwellings, on Howland avenue, $6,000; Wm. Sedwick, brick store and dwelling, Gerrard street, $3,000; G. H. Hees, Son & Company, four storey brick addition to factory, Davenport road, $23,000; J. B. Shields, two storey and attic brick dwelling, Palmerston, $5,500; Rev. W. S. Wallace, two storey and attic brick dwellings, Admiral road, $6,500; John D. Hay, two storey and attic brick dwelling, Beatty avenue, $3,500; Sullivan & Halliday, pair brick dwellings, Melville avenue, $4,000; F. L. Beecroft, three attached brick dwellings, Gould street, $7,000; Love Bros., Limited, pair brick dwellings, Gerrard street east, $3,000; Mrs. A. Stanford, two detached brick veneer dwellings, Lyall avenue, $3,000; D. McLennan, pair brick dwellings, Lansdowne, $5,500; Wm. Forster, two and one half storey brick store and dwelling, corner Roncesvalles and Fern avenues, $4,500; Hugh Munro, three pair roughcast dwellings, brick fronts, Tiverton avenue, $6,000; H. F. Sanders, two and one half storey brick dwelling, corner Roncesvalles and Westminster avenues, $4,000; J. O. Patterson, two storey brick dwelling, Hickory, $4,000; Geo. Robinson, pair brick dwellings, Westmoreland avenue, $3,800; R. C. Vaughan, four pair brick dwellings, Bathurst street, $14,400; R. Mackey, three attached two storey brick dwellings, near Sorauren, Fermanagh avenue, $6,000; J. J. Walsh, four storey brick addition to storage warehouse, Yonge street, $5,000; H. Ellis, three storey brick alterations to dwelling, College street, $4,000; H. B. Simpson & Company, pair brick dwellings, Fern avenue, $4,500; Love Bros., Limited, brick dwellings, Grandview, $3,800; Watt Milling Company, two storey and concrete planing mill, corner Osler & Norman, $10,000; S. H. Knox & Company, five storey brick alterations to store, Yonge street, $12,000; Lankin Bros., two pair semi-detached roughcast dwellings, brick fronts, Pape avenue, $6,400; Andrew Duff, pair semi-detached brick dwellings, College street, $5,000; Bryan & Thompson, two detached brick dwellings, Sidney, $8,000; Clatworthy & Son, three storey brick store, King street west, $5,500; Glyn Osler, two storey and attic brick dwelling, Scarth road, $8,000.

Victoria, B.C.
A local syndicate will build a modern apartment house on the corner of Superior and Douglas streets at a cost of $140,000. The J. L. Skene Contracting Company are interested.

Vancouver, B.C.
Recent building permits include: C. C. Delbrige, residence, William street, $4,500; A. Elbourne, three houses, Caroline street, $5,400; Rogers and McKay, dwelling, Venables street, $2,500; F. Hogg, dwelling, Fourteenth avenue, $2,500.

Winnipeg, Man.
R. A. Scott will erect three dwellings on Arlington street at a cost of $1,800 each.

A. W. Trickey will erect a dwelling on the north side of Polson avenue at a cost of $4,000.

Among residences upon which work will be begun early this spring are those of Dr. Mackenzie, Crescentwood; T. R. Billet, Roslyn road; W. A. Machaffie, Roslyn road; A. B. Stovel, Crescentwood; Mr. Daniels, of the Interocean hotel, Home street; Mr. Robinson, of the T. D. Robinson Company, Crescentwood; N. T. McMillan, Wardlow street; Mr. Stoddart, Armstrong's Point; H. Cheyrier, Armstrong's Point; Geo. Lindsay, Armstrong's Point; John Armitage, Crescentwood, and Crawford Richards, Crescentwood.

Recent building permits include: J. G. Armytage, dwelling, Ruskin Row, $16,000; Leonard and McLaughlin, two dwellings, Toronto street, $5,000; W. R. Cranstoun, dwelling, Bannerman avenue, $2,000; W. G. Lawrence, dwelling, Richmond avenue, $2,000; A. B. Stovel, dwelling, Amherst street, $18,000; D. C. Galbraith, two dwellings, Lipton street, $4,000; Peter T. Macky, dwelling, Boyce street, $2,000; A. E. Ford, dwelling, Nassau street, $5,000; W. Peterson, dwelling, Corydon avenue, $2,600.

AWARDED.

Brandon, Man.
Mr. J. Mooring has awarded to W. Bell the contract for a new residence on Lorne avenue to cost $6,000.

Moncton, N.B.
Contracts for the erection of a residence for A. H. Wetmore have been awarded by F. Neil Brodie, architect, as follows: A. Dodge, carpentry work; J. H. Burley, mason work; G. & E. Blake, plumbing; W. Steiper, galvanized iron and sheet metal work, and R. Barbour & Son, painting and glazing.

Stratford, Ont.
Ireland & Killer, architects, this city, have recently awarded contracts for a $5,000 residence for Dr. Silcox.

Winnipeg, Man.
Hinds & Mitchell have secured the contract, with a bid of $22,900, for the erection of a residence for Mr. G. W. Allan.

Business Buildings and Industrial Plants

Brandon, Man.
The Brandon Curling Club has appointed a committee to secure figures on the erection of a double-deck rink and clubhouse.

Carp, Ont.
The general store of H. McElroy & Sons was destroyed by fire last week.

Crystal City, Man.
H. E. Bird wants tenders for removing and rebuilding the Crystal City mill.

Chatham, Ont.
G. W. Rayment will remodel his flax factory on Thames street.

Fernie, B.C.
Plans for the new King's Hotel are completed.

It is stated that the Royal Hotel will be rebuilt this season.

J. Aeillo will build a two-storey business block at an early date.

The Bank of Hamilton and the Home Bank have plans for new structures.

Plans are ready for the new Imperial Hotel. Operations will probably be commenced this season.

Kefoury Bros. will build a new store building, 30 x 90 feet.

Goderich, Ont.
The Doty Engine Works will erect several new buildings this season.

Hamilton, Ont.
The Cataract Power Company have decided not to build their proposed car shops.

London, Ont.
The premises of the Murray Shoe Company were recently damaged by fire. Estimated loss, $10,000.

North Sydney, N.S.
J. T. Lane, of Boston, representing a large United States cold storage company, was recently in town looking over the ground with a view to establishing a plant.

Tenders addressed to the Kirk & Whitman Tailoring and Clothing Company will be received until May 1st for excavations, stone work, concrete work, etc., according to plans and specifications which may be seen on application.

New Alberni, B. C.
A new Anglican church will probably be erected here. G. H. Bird, E. Carvell and R. F. Blandy are members of the special committee.

Owen Sound, Ont.
The Lippert Furniture Company, Berlin, Ont., is thinking of locating a factory here.

Ottawa, Ont.
A permit has been granted to Mrs. Pageau for the erection of brick veneer shops on Murray street at a cost of $15,000.

Paris, Ont.
Taylor & Taylor, architects, Brantford, Ont., want tenders for erection of factory for the Harold Sanderson Company, Limited. (See advertisement.)

Prince Rupert, B.C.
It is stated that London (Eng.) capitalists are forming a company to develop a halibut fishing industry between Prince Rupert and Queen Charlotte Island. It is planned to establish extensive canneries.

Rosthern, Sask.
The general store of J. Henschel & Company was destroyed by fire last week. Total estimated loss, $15,000.

Sherbrooke, Que.
The ratepayers have approved a bylaw in favor of the Structural Steel Company, who will build a $25,000 plant.

Tillsonburg, Ont.
The Maple Leaf Harvest Tool Works has been purchased by the United States Fork Trust who will make considerable extensions.

Toronto, Ont.
An eight storey stone and brick business building is to be erected at the southwest corner of Richmond and Yonge streets by Ambrose Kent & Sons.

The Standard Bank will erect a modern office building on the southeast corner of King and Jordan streets.

The conservatories of Miller & Son were wrecked in an explosion last week. Total estimated loss, $50,000.

It is rumored that an American concern has formulated plans for establishing a factory for farm implements. F. E. Kenaston, Minneapolis, is interested.

It is stated that a large restaurant will be erected near the corner of Louise and Yonge streets by a United States company.

Victoria, B.C.
A permit has been issued to Lee Cheong for the erection of an $18,000 business block.

The Victoria Hardware Company will erect a new brick store.

Dr. Hall will build a new business block on Fort street.

Vancouver, B.C.
Mr. L. P. Strong, of Calgary, general manager of the Alberta Pacific Elevator Company, states that the Alberta grain men will erect a 1,000,000-bushel elevator in this city if the C. P. R. do not undertake to do so.

Premier Rutherford of Alberta is in Ottawa for the purpose of getting the Dominion Government to build a grain elevator in this city.

A permit has been issued to Dr. S. J. Tunstall for a $20,000 addition to his business block, corner of Granville and Dunsmuir streets.

Windsor Junction, N.S.
The Rockland hotel, owned by Charles Stephens, was destroyed by fire last week.

Winnipeg, Man.
A $10,000 block is to be erected on the property of N. J. Scholey on the east side of Sherbrook.

The St. John's Curling Club will erect a rink on Machray avenue. Plans will be ready on May 16th.

W. E. Skinner is forming a company to establish a steam heating and distributing plant in Winnipeg.

Tenders addressed to J. H. Russell, architect, for everything except structural steel, plumbing, heating and electrical work required in the erection of a twelve-storey fireproof office building on Portage avenue, for Mr. J. D. McArthur, will be received until May 4th.

The White Star Manufacturing Company will erect a $20,000 factory on Cooper street. Saul & Irish, contractors.

Yorkton, Sask.
The Carson block was damaged by fire last week to the extent of $2,000.

Hon. R. P. Roblin has a permit for a three storey and basement addition to the Adelaide block. Estimated cost, $21,000.

M. A. Monkman has been granted a permit for a store and apartment block at the corner of Langside street and Ellice avenue. Estimated cost, $15,000.

AWARDED.

Fort William, Ont.
Tenders were received by the Fort William Street Railway Commissioners for building the car barns, as follows: Chas. H. Sherwood, $16,200; Stewart & Hewitson, $17,345; M. H. Braden, $20,000; Carter-Halls-Aldinger Company, $21,000; Finger & Holsworth, $22,800; Street Bros., $22,850. Charles H. Sherwood was awarded the contract.

Toronto, Ont.
The Trust Concrete Steel Company of Canada, Limited, Toronto, have the contract for furnishing steel in the reinforced concrete construction of the following buildings now being erected: Wilder building, Montreal; Jacobs building, Montreal. (This will be the largest concrete building in Canada. It will have a frontage of 172 feet and a depth of 129 feet, with ten storeys and basement.); Men's Own building, Winnipeg; Roslyn Apartments, Winnipeg (the first fire proof apartment house erected in Winnipeg); McLaughlin Garage, Winnipeg; Grandview and Chambers street schools, Vancouver; Burrill Rock Drill Company's buildings, Belleville, Ont.; four storey warehouse, Dunlop & Company, Pembroke, Ont.; warehouse, Hamilton Storage & Warehouse Company, Hamilton, Ont.; concrete floors, Technical College, Halifax, N.S.; Fort Garry Terminal Station, Winnipeg.

Victoria, B.C.
Thos. Brydon, contractor, this city, has

(Continued on page 23)

Tenders and For Sale Department

Conduit

Tenders for Underground Conduit will be received up till APRIL 30TH, by the City of Toronto, Canada. For specifications and form of tender apply Electrical Department, City Hall. 17

Agents Wanted

A United States firm manufacturing chemical preparations for water purifying etc. is prepared to appoint represenratives in Toronto and other large Canadian cities. Would like to get in touch with good parties who would be in a position to purchase the chemicals, selling on his own account, or some good responsible party who would handle on commission. Correspondence strictly confidential Write Box 722 CONTRACT RECORD, Toronto. 18

Town of Estevan

Province of Saskatchewan

Tenders Wanted

Sealed tenders will be received by the Secretary-Treasurer until

Wednesday, May 19th,

for constructing a

Water Works System and Main Sewer

comprising 7,300 feet of Water Mains, 2,400 feet of Tile Sewer, also **Steel Water Tower, Gasoline Engines, and Power Pump.**

Plans and specifications may be seen at the office of the Secretary-Treasurer, Estevan, or of the Chief Engineer, 103 Bay Street, Toronto, on and after April 22nd.

No tender necessarily accepted.

L. A. DUNCAN. Esq.
Secretary-Treasurer,
Estevan, Sask.

WILLIS CHIPMAN, C. E.
Chief Engineer,
103 Bay St., Toronto, Ont.

16-18

City of Lethbridge

Alberta, Canada

Tenders for

Water Works Pump

Tenders will be received up to the 17TH DAY OF MAY, 1909, for a Steam Pumping Equipment to deliver 2,000,000 gallons per 24 hours.

Specifications, drawings and form of tender may be obtained from Messrs. Smith, Kerry & Chace, Confederation Life Building, Toronto, on and after May 3rd.

Tenders are to be addressed to Messrs. Smith, Kerry & Chase, Toronto.

Each tender must be accompanied by a certified cheque, payable to the order of the Secretary-Treasurer, City of Lethbridge, for ten per cent. (10%) of the amount of the tender, which cheque will be returned unless the tenderer fails upon request to enter into a contract at the rate stated in the tender.

The lowest or any tender will not necessarily be accepted. 17

Debentures for Sale

Tenders will be received by the undersigned up to SATURDAY, THE FIFTEENTH DAY OF MAY, A.D., 1909, for the purchase of Eleven Thousand ($11,000.00) worth of Debentures of the town of Durham bearing interest at the rate of 4½ per cent per year, running for a period of twenty years. Interest and principal payable in equal instalments of $845.64.

WM. B. VOLLET, Clerk,
Town of Durham.

17

Debentures for Sale

Seven Thousand Dollars, 15 years, 4½, Public School Debentures, municipality of Port Colborne, Ontario. Fifteen equal instalments, interest and principal payable annually. Dated May 15, 1909. Please submit offers to

J. T. HUGHES,
Village Treasurer,
Port Colborne.

17

Wanted

Names of Electrical Firms who are prepared to take up the manufacture of an electrical device requiring light machinery. Correspondence confidential.

Box 718
Contract Record, Toronto

17

Water Filtration Plant

Notice to Contractors

Tenders will be received by registered post only addressed to the Chairman of the Board of Control, City Hall, Toronto, up to noon on MAY 18TH, 1909 for the SUPPLY OF MATERIAL AND THE CONSTRUCTION OF THE NECESSARY WORKS IN CONNECTION WITH A WATER FILTRATION PLANT for the city of Toronto.

Envelopes containg tenders must be plainly marked on the outside as to contents.

Specifications and plans may be seen, and forms of tender obtained, at the office of the City Engineer, City Hall Toronto.

The usual conditions relating to tendering as prescribed by city bye-laws, must be strictly complied with, or the tenders will not be entertained.

The lowest or any tender not necessarily accepted.

JOSEPH OLIVER (Mayor),
Chairman Board of Control.

City Hall, Toronto. April 16th, 1909. 17

Wanted

for the Town of Collingwood, a resident Engineer to take charge of Road Building, Side Walks, Sewerage, and all work of a similar nature. Applicants to state experience and salary expected.

J. H. DUNCAN,
Town Clerk, Collingwood.

18

Tenders
for
Asphalt Paving

Sealed proposals addressed to the Chairman, Board of Control, Winnipeg, Man., and endorsed as above, for Grading, Curbing and Construction of Ashalt Pavements, approximately 49,672 square yards, will be received at the office of the undersigned up to 11 A.M on THURSDAY, MAY 20TH, 1909. Plans specifications and forms of tender together with conditions governing tender as prescribed by by law, may be obtained at the office of H. N. Ruttan, City Engineer, 233 James Street, Winnipeg. The lowest or any tender not necessarily accepted.

M. PETERSON,
Secretary

Board of Control Office, Winnipeg, April 20th, 1909. 18

Tenders Wanted

County of Victoria

Sealed tenders, marked "Tender for Improvements," will be received by the undersigned until TUESDAY, MAY 11TH, 1909, for the installation of a Central Heating System for the buildings in the Court House Square, Lindsay, and for certain improvements in the Registry Office, Lindsay.

Tenders may be for the individual trades or for the whole of the works.

Plans and specifications may be seen at the Court House, Lindsay, and at the office of G. M Miller & Co., Toronto General Trust Building, Toronto.

Each tender must be accompanied by a marked cheque for five (5) per cent. of the amount of tender as a guarantee that an assured contract will be entered into if tender should be accepted.

The lowest or any tender will not necessarily be accepted.

J. R. McNEILLIE,
County Clerk.

Lindsay, April 23rd, 1909. 18

Positions Wanted or Vacant

ELECTRIC AND STATIONARY ENGINEER wishes a position; good on wiring and fitting, repair and care of motors; 18 years' experience; references; Ontario Papers. Box 728, Toronto. 17

YOUNG MAN WANTS TO LEARN TINSMITHING AND PLUMBING with well-established firm; strictly temperate, with best references. Apply stating terms, Box 121, Hillside, Ont. 17

Miscellaneous

FOR SALE.—[illegible]00,000 White Stock Brick; 80 per cent. hard. R. J. DOYLE, Owen Sound. 17

WANTED—To correspond with Canadian Firms who are legitimate jobbers of electrical material, who do no contracting or sell electric current, by a manufacturer, with a view of establishing agencies in Canada for Standard Electrical Specialties paying a very liberal margin. Box 726, CONTRACT RECORD, Toronto. 17

ELECTRIC SIGNS.—A firm manufacturing up-to-date signs are open to appoint selling agents. Would like to get in touch with aggressive and reliable firms or individuals who would push this line either all over Canada or in sections to be arranged Correspondence confidential. Box 724, CONTRACT RECORD, Toronto. 18

Tenders

Sealed tenders will be received up to WEDNESDAY, MAY 12TH, 1909, by the undersigned for erection of an English Church in the Village of Burks Falls, Ont., where plans and specifications may be seen and information obtained.

The lowest or any tender not necessarily accepted.

REV'D CANNON ALLMAN,
Burks Falls, Ont.
April 20th, 1909. 17

Tenders Wanted

Tenders for all or any of the several branches of work required in the erection and completion of a proposed factory building to be built at Paris, Ont., for the Sanderson Harold Company Limited will be received up till 12 o'clock noon, WEDNESDAY, MAY 12TH, 1909.

Plans and specifications may be seen at the Architect's office.

The lowest or any tender not necessarily accepted.

All tenders shall be sealed and marked "Tender" and addressed to

TAYLOR & TAYLOR, Architects,
17 Hope Chambers, Brantford, Ont.

City of Toronto

Board of Education

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board will be received until

Friday Noon, April 30, 1909

for the several trades required for the erection of a

New School Building on Avenue Road

Plans and specifications may be seen and all information obtained at the offices of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in the said specifications and forms of tender. The lowest or any tender will not necessarily be accepted.

WM. HOUSTON,
Chairman of Committee.
W. C. WILKINSON,
Secretary-Treasurer. 17

City of Fernie

(Province of British Columbia)

Tenders for

Electric Light and Power System

Sealed tenders addressed to the undersigned will be received at the City Clerk's Office up to 5 p. m.,

May 13th, 1909

for the construction of an Electric Lighting system and the equipment in connection therewith.

Copies of plans and specifications may be obtained at the City Engineer's office.

Each tender must be accompanied by a certified cheque for 5 per cent. of amount of bid, payable to the order of the City of Fernie.

Individual tenders will be received for

(a) Electric Lighting Distribution System.
(b) Erection of Power House and Foundation.
(c) Removal of Power Plant from Coal Creek and erected in station at Fernie, and installing Boilers.
(d) Supplying 3 Horizontal Return Tubular Boilers, 150 H.P. guaranteed B.C. Inspection at 125 lbs., with Stack and Blower complete, one Feed Water Pump, one Injector, one Feed Water Heater.

Tenders may be made for one or more of the above items.

The lowest or any tender not necessarily accepted.

R. POTTER,
City Engineer.
G. H. BOULTON,
City Clerk. 18

Business Buildings and Industrial Plants

(Continued from page 21)

been awarded the contract for an $18,000 business block to be erected by Lee Cheong on the northwest corner of Broad and Yates streets.

Welland, Ont.

The contract for the erection of the Dain Manufacturing Company's factories is stated to have been awarded to the Leonard Construction Company, Chicago.

Winnipeg, Man.

The steel beams, columns and iron work used in the new Bank of Nova Scotia Building, Winnipeg, were all supplied by the Dominion Bridge Company, Limited, through their western branch. Mr. E. E. Shepherd, manager, Winnipeg.

Power Plants, Electricity and Telephones

Brantford, Ont.

The most important piece of work to be undertaken in connection with the reconstruction of the street railway is the relaying of the Colborne and Market street lines. According to the contract with the city this work must be done within three and four months respectively from May 1. The reconstruction of the line on other streets, and the construction of some additional lines, has to be completed within two years. When the lines are reconstructed in accordance with the agreement, there will be sixteen miles of electric railways in the city.

Collingwood, Ont.

A syndicate headed by J. P. Charlebois has been formed to develop water power on the Osler property, which has been purchased for this purpose. The total expenditure involves $100,000.

Cobourg, Ont.

The Cobourg, Port Hope & Havelock Electric Railway Company has been granted a charter for a line which will run across Northumberland County to Warkworth and Campbellford and on to Havelock, with branches to Blairton and to the Marmora mining district, and other branches from a point near Warkworth to Roseneath and Hastings. The company includes Col. H. A. Ward, K.C., of Port Hope, secretary of the company; W. J. Crossen, Cobourg; H. T. Bush, Port Hope, E. S. Huycke, K.C., Port Hope, and Reeve Jos. Knox, of Havelock.

Calgary, Alta.

The Province of Alberta has received petitions for the construction of approximately 3,000 miles of telephone line during the present year and plans have been accepted for some 900 miles of line. In addition to the rural lines a trunk system will be built from Medicine Hat to Taber, a distance of 90 miles, and an additional wire will be strung on the circuit connecting Calgary, Edmonton and Fort Saskatchewan.

Fernie, B.C.

Tenders are invited by the city for electric light and power system, erection of power house and removal of power plant from Coal Creek. (See advertisement.)

Kamloops, B.C.

At a recent meeting of the City Council, notice was given of a bylaw to raise $25,000 for the improvement of the lighting plant. Consulting Engineer Dutcher has forwarded plans and specifications for these improvements. Tenders will probably be called for at an early date.

Nelson, B.C.

It is proposed to build a telephone line from Nelson to Salmo, permission having been obtained from the Great Northern Railway for use of its telephone poles for $5 per pole per annum.

Newtonville, Ont.

Another independent telephone line to connect Orono and Newtonville has been organized in Durham county. The officers are: President, W. H. Reid; vice-president, Andrew Sharpe; secretary-treasurer, Moses Cowan; directors, H. W. Renwick, W. N. Buckley, H. Millson, R. Ferguson and John Turner.

New Hamburg, Ont.

The town have decided to purchase $20,000 worth of preferred stock in the proposed People's Railway Company. The Metropolitan Railway Company may build the line which will run from Stratford to Guelph. The company's capitalization is $1,000.000, and other municipalities along the line will be asked to purchase stock in the enterprise.

Portage la Prairie, Man.

The charter for the new electric light and power company for this city has been received from the provincial authorities. The construction of the plant is postponed until the submittal of a bylaw authorizing the local franchise.

St. Catharines, Ont.

The promoters of the proposed Dunnville, Wellandport and Beamsville Electric Railway have been asked to extend their line from Beamsville to Jordan Harbor and St. Catharines. Mr. Gough, the company's engineer, states that should Beamsville, Louth and Clinton townships, and St. Catharines city put up a bonus of twenty thousand dollars, they will build the extension to Jordan Harbor and St. Catharines.

Victoria, B.C.

It is stated to be assured that the B. C. Electric Railway Company will ultimately establish a generating plant on the Jordan river. A. B. Carey, C.E., of Gore & McGregor, who has been employed by the B.C. Electric Railway Company in their investigations, states that there is a sufficient flow of water to provide 10,000 horse power the year round. The estimated cost of the proposed plant is $2,000,000. No further developments will ensue until the company and the city come to an agreement.

Winnipeg, Man.

The Street Railway Company are contemplating improvements, including erection of power sub-stations and rebanding tracks.

During the present year the Manitoba Government, it is said, will spend some $800,000 on improving and extending its telephone system. According to a statement made by one of the commissioners $450,000 will be spent on material and $350,000 on labor. The work will be divided up as follows: Underground and aerial work in Winnipeg, $160,000; two new exchanges and switchboards in Winnipeg, $110,000; rural and farmers' lines, $270,000; alterations and additions to exchanges, $104,000; extensons to long distance lines, $156,000. Tenders will be called for various supplies from time to time as they are required.

At the annual meeting of the Winnipeg Electric Railway Company, it was decided to issue $1,500,000 in new stock, the proceeds to be used for extensions and improvements.

Windsor, Ont.

The Windsor Tunnel and Lake Erie Company expects to start construction on its projected line early in July. This line will connect Windsor, Sandwich, West Vereker, New Canaan, McGregor, Huron and Oxley, and will have a total length of about 30 miles. It is proposed to connect the line with the Detroit river tunnel, and so secure connections with the electric railway lines in Detroit, Mich. The officers are:—President, R. A. Bailey, Detroit; vice-president, Dr. J. A. Smith, Windsor, Ont.; treasurer, W. Boug, Windsor; secretary, J. G. Leggatt, Windsor.

AWARDED.

Lake Superior Junction, Ont.

The Consolidated Tramway Company, 45 Broadway, New York, has closed a contract with the Northern Pyrites Company, 82 Beaver street, New York, for the construction of a two-mile line of Lawson's looped-section tramway near Lake Superior Junction, Ont.

Winnipeg, Man.

Contracts have been awarded by the Board of Control for furnishing and installing one turbine pump, with a capacity of 25,000,000 gallons per 24 hours, and one 350 horse power motor to the Northern Electric & Manufacturing Company for $11,000. H. N. Ruttan, city engineer.

Miscellaneous

Chilliwack, B.C.

Tenders addressed to Chas. W. Webb will be received until April 30th for the purchase of $7,000 school debentures.

Greenwood, B.C.

The ratepayers have endorsed the proposed $50,000 bonus to be paid to the Greenwood-Phoenix Tunnel Company. Active operations must be under way by May 1st and the first 3,000 feet must be constructed by November 1st, 1911. The first section of the tunnel will be 6,000 feet long and 1,300 feet deep.

Glencoe, Ont.

Tenders addressed to J. W. Watterworth, Treasurer, Township of Mosa, will be received until May 1st for $2,158.50 drainage debentures.

Montreal, Que.

At a recent meeting of the St. Louis council, it was decided to call for tenders for the construction of the proposed tunnel under the C. P. R. tracks on St. Lawrence street. Estimated cost, $135,000.

Ottawa, Ont.

Tenders addressed to N. J. Ker, City Engineer, are wanted until April 29th for supply and delivery of a 25-horse power locomotive type boiler. Specifications on application.

Toronto, Ont.

The controllers have voted down the proposition to submit a bylaw to raise $76,000 for the building of a new sand pump.

Tenders addressed to H. F. McNaughten, Secretary, Department of Public Works, will be received until April 29th for excavation required for extension of Parliament Buildings. Plans at office of G. W. Gouinlock, architect, 1108 Temple Building.

AWARDED.

Halifax, N.S.

The Board of City Works recently opened tenders for iron pipe and valves. The tenderers for the water supply contract were the Canadian Iron Corporation, Limited, Londonderry; Stoneley Coal and Iron Company, England; W. Stairs, Son & Morrow; Watson Jack & Company, Montreal; J Coates & Company, of London; Canada Foundry Company, Toronto; L. H. Goudey & Company, Quebec; W. Beverley Robinson, Montreal; D. Y. Stewart & Company, Glasgow; and R. D. Ward & Company, of Philadelphia. The tender of W. Beverley Robinson, being the lowest, was recommended to the City Council for acceptance. The qualities and prices are 87,000 feet 12-inch pipe at $28.70, 25,000 feet 9-inch pipe, at $29; 10,000 feet of 6-inch at $29.80; and 500 feet 3-inch at $31.67, delivered. The tenderers for supplying iron socket valves were Stewart & Company, Canadian Foundry Company, W. Jack & Company, and Stairs, Son & Morrow. The Canadian Foundry Company offered to furnish 25 6-inch valves at $9.65, 6 3-inch at $4.55 and 15 12-inch at $38.65, and the tender being the lowest, was recommended for acceptance.

Medicine Hat, Alta.

The following contracts were awarded at a recent meeting of the City Council: New market building, J. L. Peard, $4,125; contract for pipe fittings, etc., James Rae, $2,264; wooden pipe, Pacific Coast Pipe Company, $5,772. The tenders for iron pipe were left in the hands of the committee to award the contract, when additional information is received. The tenders received for putting the roof on the grand stand were not opened. The contract for brass goods went to James Morrison Company, of Toronto, at $852.37, and for the hardware to the W. B. Marshall Hardware Company at $601.68.

Toronto, Ont.

The Temiskaming & Northern Ontario Commission have awarded a contract to O'Boyle Bros., Sault Ste. Marie, for the construction of culverts at mile posts, 21½, 15¾, and 62½. The Dominion Wire Manufacturing Company, of Montreal, were successful in their tender for 75,000 pounds of hard-drawn copper wire, No. 10 gauge, to be used in the building of new telegraph lines. The Thorne Cement Company, Toronto, were given the contract to supply three carloads of cement.

Winnipeg, Man.

The Williamson Construction Company, has sublet the contract for clearing, corduroying and ditching the right-of-way for the Winnipeg municipal power transmission line from the city to Point du Bois to J. D. Houston and M. Berger, of Winnipeg. The work will be proceeded with at once.

New Companies

St. Clair Construction Company, Toronto, incorporated, capital, $40,000. Incorporators, J. L. Ross, A. W. Holmsted and W. L. Carr, Toronto.

Ontario Lime Association, Toronto, incorporated to manufacture sewer pipe, cement, etc. Incorporators, G. H. Kilmer, J. A. McAndrew and W. H. Irving, Toronto.

Maple Leaf Portland Cement Company, Toronto, incorporated, capital $50,000. Incorporators, H. Riley, J. E. Riley and E. C. Ironside, Toronto.

Ontario Sanitary Manufacturing Company, Windsor, Ont., incorporated, capital, $40,000. Incorporators, F. A. Black, R. H. Evans and H. L. Evans, Detroit.

Muskoka Sand and Gravel Company, Toronto, incorporated to manufacture cement, capital, $40,000. Incorporators, W. Sandford, New York, and G. A. Marchant and H. L. Dunn, Toronto.

Simoneau et Dion, Sherbrooke, Que., incorporated to construct buildings and manufacture sewer pipe and cement, capital, $150,000. Incorporators, L. Simoneau, A. Dion and E. D. Kelly, Sherbrooke.

Wizard Furnace Company, Toronto, incorporated, capital, $100,000. Incorporators, J. E. Denise, C. E. Howarth and W. M. Weekes, Toronto.

Welland Tin Plate and Sheet Company, Welland, Ont., incorporated, capital, $150,000. Incorporators, J. Huxley, Pittsburg; A. B. Spencer and B. J. McCormick, Welland.

National Iron Works, Toronto, incorporated, capital, $200,000. Incorporators, A. Mullin, F. Lane and T. A. Silverthorne, Toronto.

Berlin Table Manufacturing Company, Limited, Berlin, Ont., incorporated, capital, $40,000. Incorporators, W. and H. M. May, J. and J. C. Wurm, all of Berlin.

John Watson & Son of Montreal, Limited, Montreal, Que., incorporated to manufacture ornamental and architectural iron work, etc., and to acquire the business of John Watson & Son, capital, $49,000. Incorporators, R. T. Heneker, A. H. Duff, W. S. Johnston, W. A. Merrill and A. F. Hall, all of Montreal.

Severn Power Company, Limited, Toronto, Ont., incorporated, capital $150,000. Incorporators, W. Graham, T. E. McCraken, J. R. Roaf, M. D. Johnston and Col. Rice, all of Toronto.

Chaudiere Supply Company, Limited, Ottawa, Ont., incorporated to manufacture machinery and tools of all descriptions and to acquire the business of the Chaudere Supply Company, capital $20,000. Incorporators, Andrew Wilson, R. Poe, F. B. Wilson, R. C. Roe and B. Pannett, all of Ottawa.

Horwood Glass Manufacturing Company, Limited, Ottawa, Ont., incorporated, capital $20,000. Incorporators, C. G. Horwood, H. Horwood, W. T. Powis, C. J. Stone and M. Horwood, all of Ottawa.

Business Notes

R. Paquette Water Works, Limited, Rigaud, Que., has obtained a charter.

Brickman & Baker, plumbers, Stratford, Ont., have dissolved partnership.

The Foster Rural Telephone Company, Limited, Abernethy, Sask., has been incorporated.

The Portal Light & Power Company, Limited, North Portal, Sask., has obtained a charter.

The Vancouver Steam Supply Company, Limited, has been incorporated with a capital of $500,000.

The Nanaimo Gas & Power Company, Limited, Nanaimo, B.C., capitalized at $100,000, has obtained a charter.

J. J. Perrier, contractor, Montreal, Que., has assigned; Manhire & Quigley, plumbers, same city, have dissolved partnership.

L. H. Gaudry & Company, Limited, manufacturers of implements, iron pipes, etc., have registered. C. Lenghen & Son, plumbers, same city, have assigned.

The Colbert Plumbing & Heating Company, Limited, capitalized at $25,000, has been incorporated to acquire the business of John Colbert, Victoria, B.C.

The following companies have been incorporated under the laws of the Province of British Columbia: Fort George Lumber & Navigation Company, Limited, capital $50,000; Nanoose Lumber Company, Limited, capital $25,000; Rivers Inlet Lumber Company, Limited, capital $1,000,000.

ESTABLISHED 1886

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United States and Foreign	2.50

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Building Trade Ethics and the Essentiality of Their Observance

The keynote of the successful and satisfactory completion of every business transaction is integrity. Especially is this true in regard to the relations between the architect and contractor. As a general rule in recent years the ethical side of the contracting business, from both the contractor's and the architect's point of view, has greatly improved. The progressive architect and the enterprising builder of to-day both realize that strict honesty is indispensable at all times. Each has grasped the fact that reputation counts; each appreciates, at its true worth, the old adage, "Honesty is the best policy."

Occasionally, however, perhaps too occasionally, one encounters an exception. The contractor who is willing to pay for obtaining a job is not altogether a rare example. Now, apart from the dishonesty and unfairness of the thing, the man who employs such methods is committing commercial suicide by a painful and miserable process. He places himself in the hands of those who, by their very connection with him in his sharp practices, are men of no reliance or principle. Sooner or later he will find that the kind of honor there is among thieves is a weak reed upon which to depend.

Then there is the contractor, who, from various reasons, temporary pressure of work, miscalculation, poor finances and so on, "skimps" his work. For a time he may be prosperous, but his prosperity will not be, cannot be, of the enduring kind. Such a man is a fool to himself. He is risking too much for too little. In some respects he is similar to the bank clerk who absconds with a thousand dollars. He does not consider the future. There must come the rude awakening at some time.

Another of these "exceptions" is the contractor who has cultivated a taste for "extras." In this regard it is the architect who is usually to blame, but most people in the business have at some time or other heard of the shrewd contractor, who, in making out his bid, discovers some important detail which has been overlooked, thus enabling him to submit a much closer figure than any of his competitors, ultimately balancing himself in the column for "extras." A case is recorded of an architect, who in the preparation of his plans, forgot to include a stairway. The "shrewd" contractor happened along with an unusually low bid, secured the job, and afterwards managed to get a nice little rake-off on the contract. There are those, of course, who would consider that the architect alone is to blame for any omission of this sort. That he is worthy of censure is indisputable, but this is not the point. The point is that in order to establish the desired relationships between the architect and the guarded by the other.

As for the architect, he should be unapproachable from any corrupt standpoint. When one enjoys the acquaintance of so many members of the architectural profession who are the soul of integrity, it is only with delicacy that one can approach the subject, but it must not be forgotten that there are those who have been unfortunate enough to encounter so much unscrupulous work in the building business that they are ready to say with Sir Robert Walpole, "Every man has his price." Another professional transgressor, and not an altogether unheard of one, is the architect who will let the contractor suffer for some omission on his, the architect's part.

The object of these remarks, however, is not to make a pretended exposure of the methods employed in the business or to impress upon the reader any pessimistic idea of the building trade ethics. Rather is it desired to direct the attention of any who are in the least degree culpable to the folly of continuing along any lines which cannot be subjected to the light of day. There is always a danger, in such considerations as these, of offending those whom it is least desired to offend, but, on the other hand, there is the happy chance of a stray word reaching the one back-slider. There are occasions in the lives of most of us when we have to pause and reflect upon the value of honesty, from both a selfish and a virtuous standpoint. In these keen competitive times every one who is connected in any way with the business of tendering must be above reproach if he is going to get into the front rank and remain there. The strictest integrity is not only *desirable*; it is the *sine qua non* in the whole consideration of success.

It is sad but true that the man who can turn his hand to anything and the man who knows it all, accomplish but little.

Municipal Engineering and Construction
Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

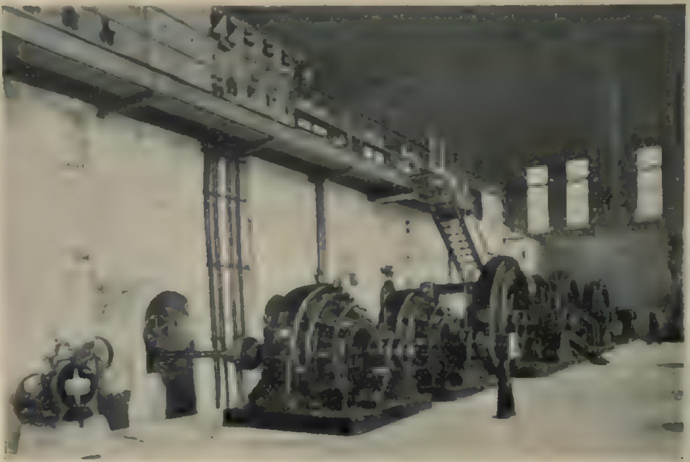
Construction and Equipment of Kenora Power Plant

The town of Kenora, Ont., (formerly Rat Portage), has a population of about 7,500, and is situated at the northerly end of the Lake of the Woods, at the point where the lake empties into the Winnipeg River. The main line of the Canadian Pacific Railway passes through the town of Kenora. The discharge of the Lake of the Woods, which drains the Rainy River district, about 23,000 square miles in area, enters the Winnipeg River through two natural outlets, about half a mile apart, known as the eastern and western outlets. There is a fall at each end of these outlets of from 17 to 21 feet, depending on the height of the water in the river. A regulating dam in the larger, or western, outlet, maintains a fairly uniform level in the lake, but there is considerable fluctuation in the river below the fall between periods of high and low water.

Kenora, Ont., Power House.

The town of Kenora for several years operated a small hydro-electric plant for lighting the strets and residences, but this had been operating to its utmost capacity for some time, and it was absolutely necessary that a larger plant be built in order to accommodate the growing requirements of the town; and also to furnish an attraction in the way of cheap power, to encourage the establishment of manufacturing industries in this district. A lease of the whole power of the eastern outlet was accordingly obtained from the Ontario Government, and the work of development was commenced on May 1st, 1906, by the town authorities. An unusual feature of this development was the fact that the whole flow of the eastern outlet could be cut off without the necessity of making any provision for handling the surplus water in time of freshets, on account of the availability of the western outlet for carrying the whole discharge of the lake without causing any appreciable variation in level of the water in the lake.

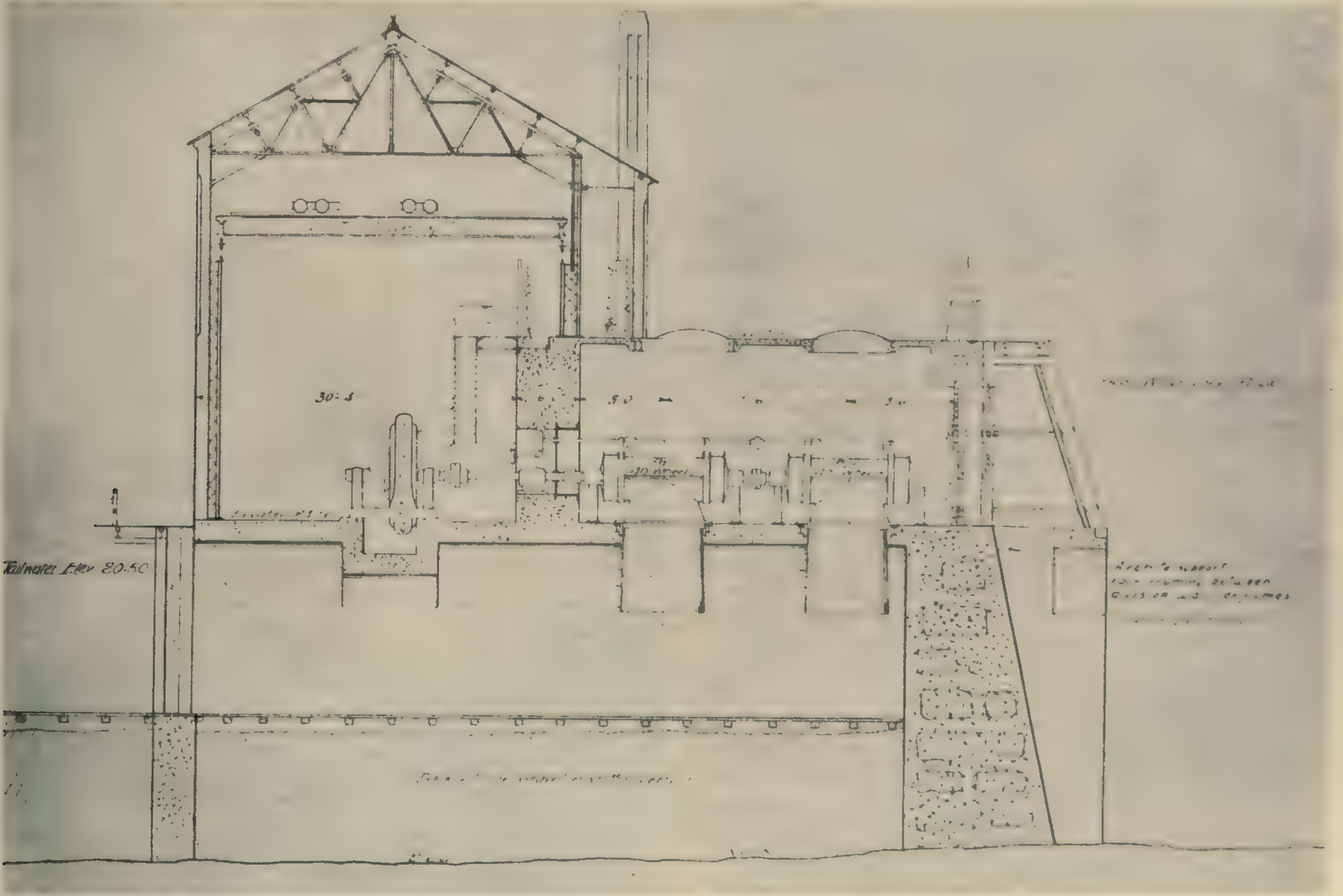
In order to unwater the site of the power house it was necessary to build coffer dams across the stream above and below the falls. The river at this point flowed through a rocky gorge, the cliffs on the west side being almost perpendicular, and on the east side at an angle of about 30 degrees with the horizontal. Accordingly a timber crib coffer dam, about 175 feet long, was built in an average depth of 16 feet of water at a point about 200 feet above the head of the falls. A great deal of trouble was experienced in the construction of this dam as the current was fairly swift at this location and the cribs were placed on a deposit of gravel and boulders of unknown depth, which washed out more or less and caused very extensive undermining of the cribs. This difficulty was at length overcome by the ingenious expedient of collecting large sections of a floating island, consisting of entwined roots and weeds, which had formed the top of a muskeg and had floated down the lake to a point near the development, and sinking these sections in front of the coffer dam. By this means the leakage through the dam was eventually reduced to small dimensions, and this was taken care of and carried past the construction work through a small wooden open flume and discharged below the lower coffer dam. At the stage of proceedings when the coffer dams were partly installed, an unfortunate delay occurred by reason of the owners of land on each side of the river at this point being granted an injunction restraining the town from proceeding further with the construction works, on the plea that the Ontario Government had no right to grant a lease on the water power, as the owners of the land (the riparian owners), had all the rights to the power by reason of their possession of the lands on each side of the stream. All work ceased on June 19th and was not resumed until July 14th, an arrangement between the parties having been arrived at on the previous day. Work was then pushed on in connection with the construction of the lower coffer dam below the power house site. This coffer dam extended from bank to bank across the stream in from 18 to 23 feet of water, and it was 265 feet in length.


Kenora, Ont., Power House, Interior.

About the middle of September the pumping out of the site between the two coffer dams had progressed far enough to allow the excavation to be started. The material that had to be excavated consisted of a bed of boulders and quicksand, having a total depth in some places of 28 feet before bed rock was reached. The first concrete was placed on October 1st, and the depositing of concrete and the excavation were carried on simultaneously. Considerable difficulty was experienced in connection with the excavation in quicksand as a certain amount of leakage from both the upper and lower coffer dams kept it more or less constantly wet. Another serious difficulty was that of procuring the necessary kind of labor, as the large amount of railway construction work going on in Western Canada, together with the work of harvesting in Manitoba, had caused the supply to fall short of the demand.

On the last day of November the concrete work was completed. The total quantity placed amounted to about 7,500 cubic yards. The excavation had previously been finished about the middle of November and this work amounted to about 15,000 cubic yards.

The structural steel work of the power house was erected as quickly as the completion of concrete work would permit; and brickwork was commenced on Nov. 10th, but was not completed until Dec. 31st, owing to the intense cold weather which was experienced throughout the month of December. The roof, consisting of 2-ply of 1¼-inch boards with felt between, covered with a 4-ply felt roofing, was then applied, and the building enclosed so as to exclude the weather. The structure was then kept heated to allow of the finishing and placing of machinery to proceed.



Kenora, Ont., Power House, Typical Cross Section.

Stone for the concrete, which was a very hard trap rock, was quarried in the bed of the river at the site of the falls, where the natural cross section of the stream was enlarged in order to secure greater area and thus reduce the velocity of the water as it entered the forebay. A steam hoist raised the stone in scale boxes to the crushers, where it was broken to 2-inch cubes, and then it was conveyed in dump cars to the concrete mixers, of which there were two in operation on the job. The concrete was all conveyed on runways in wheelbarrows and dumped into position. Large displacers quarried from the site were built in the heavy concrete walls, care being taken to have about 12 inches of concrete around all large displacer stones. Single horse dump-carts were used to take out the quicksand, and two steam hoists and a hand derrick handled the large boulders and excavated rock.

The site was quite uneven, there being little level ground on which to store materials, so that a great deal of planning was necessary to arrange for a suitable layout of the construction plant and for the disposal of excavated material. The power house extends completely across the stream from shore to shore, and is joined to the rocky banks by heavy concrete walls. Through the wall on the western end of the power house a log-sluice is provided to take care of any lumbering which may require a passage in the future. A typical cross-section of the power house is shown in the accompanying sketch. It will be noted that the heavy breast wall, tail race arches, and flume walls are of concrete, while the power house building is of brick with steel columns and trusses, and wooden roof. The building is equipped with a 20-ton hand-power travelling crane, which is provided with two trolleys, each carrying a 10-ton chain block. The rack framing and slides for head gates and stop logs in front of the flumes are of structural steel rivetted together, and were designed to be self-supporting during erection and until built into the concrete work. The wheel chambers are covered with a 6-inch slab of reinforced concrete forming a floor, with manholes in same, 7 feet in diameter, for getting at future turbines. The head gates are of wood, raising in two sections, one in front of the other, with two sets of gates to each flume or wheel chamber. There are seven flues 18 feet wide, with 4-foot dividing walls of concrete; the central flume is divided into two equal compartments by a 2-foot reinforced concrete wall, and contains the two exciter wheels, thus providing for six power units and two exciter units. Each flume is provided with a 12-inch cast iron pipe and valve for filling the flume, in order to equalize the water pressure on both sides of the head gates before opening them, and an 8-inch valve for emptying the flume in case of inspection of wheels, or for repairs.

Each hydraulic unit—three of which are now installed—consists of two pairs of 40-inch "Samson" turbines mounted on a horizontal shaft, which is direct connected to the generators through flange couplings. Each unit is guaranteed by the makers to develop 900 H.P. at the generator coupling when operating under a 17-foot head at 150 revolutions per minute. The wheel gates are of the register type, and are controlled by a sleeve ring connected by links to, and actuated by, a single shaft connected to the governor, and carried in bearings on top of the wheel setting or draft chests. The water wheel main shaft and the gate shaft are carried through a heavy cast iron bulkhead, which is provided with stuffing boxes for that purpose, and is set in the concrete wall, which is 6 feet thick, and which divides the flumes from the power house. A heavy collar bearing is set and anchored in this wall, immediately in front of the cast iron bulkhead, and this takes care of any end thrust in the turbine shaft, which in such a setting of right and left hand wheels will be comparatively light. The exciter units, which are two in number, are situated in the centre of the building. Each constitutes a single pair of 30-inch "Samson" horizontally mounted turbines direct connected to direct current generators. The large units are each controlled by a type "N" Lombard water wheel governor, and each exciter unit is regulated by a Woodward governor of the compensating type.

The electrical equipment as at present installed consists of three A.C. 3-phase, 60-cycle, 2400-volt generators of the revolving field type, of 625 K.W. capacity each, running at 150 R.P.M.; and two exciters of 175 K.W. capacity each, running at 175 R.P.M. The generators are designed to operate continuously at a load of 500 actual kilowatts at a power factor of 80 per cent. and at a potential of 2400 volts, with a temperature rise not exceeding 35 degrees centigrade, and after a 24-hour run under these conditions are capable of operating for an additional 24 hours at a 25 per cent. increase in load at the same power factor and voltage, with a temperature rise not exceeding 50 degrees centigrade. The lead covered cables from the electrical machines are carrrid through ducts in the floor and up the face of the bulkhead wall to the switchboard, and thence out through the east gable of the building, where they connect to the transmission line leading to the town, which is approximately one mile from the power station.

The switchboard, which is of blue Vermont marble consists of 12 panels divided as follows: 5 feeders, one exciter panel, three generator panels for present equipment, and three panels for future generator installation. The switchboard is so arranged that no potential on the front of it is over 110 volts. The switches, bus bars, feeder mains, etc., are carried on an insulated structure nine feet to the rear of the operating board. The rods operating the switches pass through trenches in the concrete floor from under the board to the rear, where the switches are placed. Each generator panel is equipped with ammeter, volt meter and synchronizing receptacles. These are so connected to the synchroscope swinging on an end bracket on the switchboard that by means of the cross connecting plugs furnished with the board the synchroscope can be made to indicate for any one of the three generators, thus permitting the generators to be thrown together in any order desired. The feeder panels are equipped with three ammeters, as well as the 6-pole, high voltage oil switch, which in time of emergency permits the instant breaking of current in the feeder circuit. The exciter machines are furnished with equalizing pedestay and switch, enabling the excitation of the generators to be thrown from one exciter to the other without even a momentary pause in the operation of the plant.

The cables are all lead covered and are carried through the ducts on corrugated cable racks, and are secured along the wall on their way to the inside cross arms at the east end of the building, on vertical cable racks and specially designed cleats. The choke coils and lightning arresters are placed on the cross arms at the interior of the entrance in the east gable. One large unit and one exciter unit was completed and a temporary switchboard built and the power was turned on on February 9th, 1907, thus relieving the lack of light and power in the town, which had been but poorly supplied by various temporary steam installations throughout the period of construction.

The complete plant has a capacity of 5,000 electrical horse-power, when operating under normal conditions. The town requires for its own use, for lighting the streets, stores, residences, and for operating the pumps of its water works system, about 750 h.p., and the Maple Leaf Flour Mills Company requires 1,000 h.p. This company's new mill, which was completed in the fall of 1907, had only operated a few months when it was unfortunately destroyed by fire. The rebuilding of same, however, has been completed. Their contract with the town gives them the right to demand and use up to 2,000 h.p. The town has still available for manufacturing industries locating in the district, a considerable block of power which it is prepared to lease at attractive figures.

The general designs, plans and specifications for the whole of the work were prepared by T. Pringle & Son, Limited, hydraulic and mill engineers and architects, of Montreal, Que., and the construction was carried out under their supervision. Mr. G. M. Wynn was their resident engineer at Kenora. The contract for the wheel pits and power house, etc., consisting of unwatering, excavation, concrete work, brickwork and general building trades was awarded to Messrs. Kelly Bros. & Company, of Kenora, on a cost-plus-a-fixed-sum basis. The structural steelwork was supplied by the Locomotive & Machine Company, of Montreal, Limited. The hydraulic equipment was furnished and installed by the William Hamilton Manufacturing Company, Limited, of Peterborough, Ont., and the electrical equipment was supplied by Allis-Chalmers-Bullock, Limited, of Montreal, Que.

Toronto builders are complaining about the scarcity of brick, and fears are entertained that many buildings will be held back until the supply from the kilns is available, about the middle of May. Very little has been said about the scarcity, because outside brick makers would make a rush for the trade and reduce the demand for brick made in the local yards when the kilns are opened.

The new City Engineer of Brandon, Man., is Mr. R. E. Speakman, C.E., not Mr. A. B. Speakman, as erroneously stated in our last issue.

Winnipeg Civic Employe's Useful Invention

One of the greatest problems in winter operations is claimed to have been solved by a frost excavator invented by Mr. W. Hurst, city sewer foreman of Winnipeg.

This frost excavator is worked on the same principle as a pile driver. A steel chisel 6 inches in diameter and ranging in length from 3 to 7 feet, is fastened to a cast iron hammer weighing 800 pounds. The machine is usually operated with a 14-foot clear drop, and has so far been worked with a 10-h.p. engine (steam, gasoline or motor) and when working continuously gives about ten blows a minute. It is mounted on a set of trucks which carry the engine and boiler. There is a boom attached to the trucks swinging at right angles to the working face of the machine. The boom is used for raising the heavy chunks of frozen earth into the waggons or on the side of the street when used on sewers. A particular feature of this machine is that it has movable guides for the hammer, which allows the chisel to be moved sideways a distance of five feet each way from the centre of the machine without moving the trucks, this only being used on trenching work.

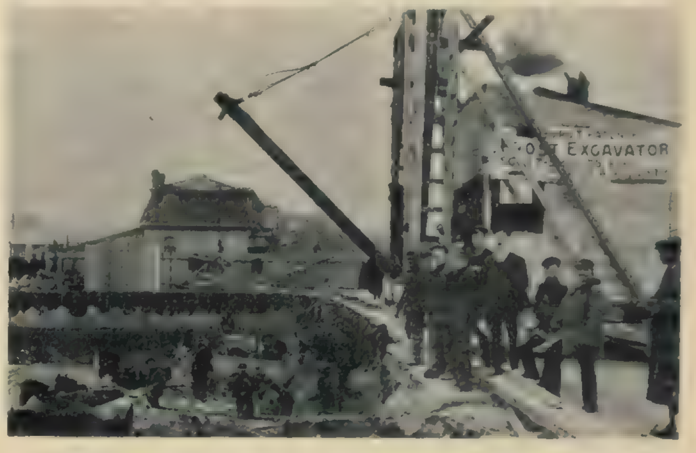
The machines built are of framed timber, allowing the leads to travel horizontally about 12 feet. The machine is now being designed in four types, one for small work (residences), one for sewer work, one for large cellar and foundation excavations, and one for railroad, quarry or brickyard work. The first and the fourth of these types will be similar in design, varying only in size, and will, as well as the third, be mounted on a turntable. These machines will all be built in steel and plans are now in preparation.

Excavating on one of the large sewers for the City of Winnipeg. Reading from left to right: Messrs McGee and Hutt, of the T. Eaton Company, and the Inventor, Mr. W Hurst.

Previous to the introduction of this machine, all excavations for the five or six months of the winter in Winnipeg have been done by hand picking or powder blasting. By the hand picking process the cost of excavating frozen soil has been approximately $1.35 per cubic yard, and by blasting with powder, the cost has been in single cases reduced to 98 cents per cubic yard, but usually runs about $1.25 per cubic yard. The use of dynamite for blasting within the city limits is considered too dangerous.

The cost of operating this machine daily is approximately as follows: One engineer, $3; one fireman, $2; four men, $8; coal and oil, $3.50; rent, $5 (when rented), making a total of about $21.50 per day. This takes the place of 75 to 100 men on sewer work at a cost of about $175 per day.

The machine has been used with great success by the following: City of Winnipeg, sewer work (the city owns one of these machines); T. Eaton Company, excavation for warehouse at Winnipeg; J. Girvon, contractor for the Enderton Block, Winnipeg; Dobson & Jackson, contractors, excavation for apartment block, Winnipeg; Mr. Carr, Portage la Prairie, contractor for the Needle dam, Assinaboine river, and excavating through five feet of frozen sand for sheet piling.



Frost Excavator at work on excavation for The T. Eaton Company's Warehouse, Winnipeg.

On the above works the average cost of excavating the upper layer of from five to six feet of frozen soil has been from 11 to 30 cents per cubic yard, and the daily output from two to three hundred cubic yards, and fifty to sixty cubic yards on sewers.

For Removing Smoke Stains

A new compound for cleaning smoke stains from brick fronts has recently made its appearance on the market. After a fire in a building the brick work is often badly discolored about the doors and windows with smoke and gases, and the removal of this during the work of reconstruction has always been a laborious task, usually accomplished by the use of sand and water and a wire brush. The new compound is composed of one gallon of soft soap, to which is added two pounds of powdered pumice, double 00 or F, and one pint of liquid ammonia. First remove as much of the soot as possible with the stiff broom or fibre brush. Then apply the soap and ammonia mixture with an ordinary fibre brush, or common whitewash brush, and let it remain on for about 20 or 30 minutes, and the discoloration will disappear.

The Canadian Manufacturers' Association recently made application to have road graders placed on the agricultural implements freight list, the reason given being that the farmers of the west frequently clubbed together and bought road graders. The solicitor for railways contended that road graders could not be specified as farm machinery or agricultural implements, and that no change should be made in classification. Chairman Mabee said that he could not see how a change in classification could be made, but promised that the board would consider the matter.

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

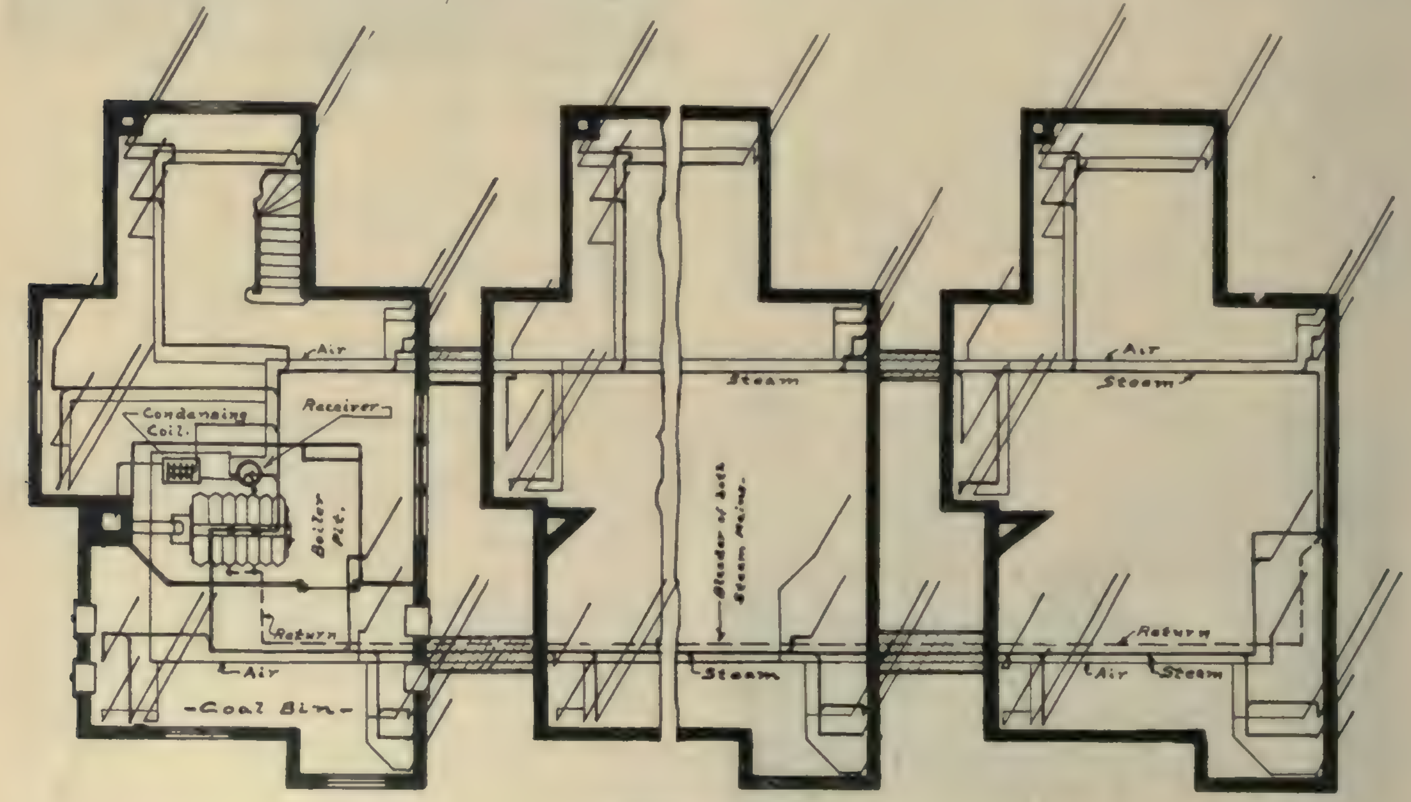
The Vapor System of Heating

A system of vapor heating is often recommended for all classes of buildings by the leading heating and ventilating engineer sand contractors, also by the most advanced architects, on account of its having proved satisfactory in operation and in general results, says P. W. Rathbun in the "National Builder." A vapor system consists of the ordinary hot water radiator, a regular steam boiler of sufficient capacity, a damper regulator, sometimes known as the receiving tank or casting, a diagramic throttle radiator valve in the place of the common wood wheel radiator valve, an ordinary union elbow, a condensing radiator with connection to flue, together with mains of sufficient size and capacity graded to alignment.

The accompanying plans show a vapor system which was designed by the writer and installed under his personal supervision. It is giving to-day, and has for the past two years, been giving excellent satisfaction, proving a great saving t othe owner in the matter of coal bill. Before going further, I wish to say that all flow connections to radiators are three-quarter inch, and all return connections half-inch. The flow main is the same size as for an ordinary steam system, and the return main one size smaller. Where more than one radiator is connected on one riser, the area of the taps should be computed. You will see by the accompanying layout that there are six modern residences of the same design, located alongside each other a distance of three feet apart. The boiler is placed in the corner one, which is the owner's home. Here is where the mains start and finish. This makes a central heating plant for the five residences occupied by tenants and for the owner's home. Totalizing the radiation, there would be approximately 335 feet per building. Of course it is understood that the corner house has more exposures than the others, so requires a larger quantity of radiation. This job was installed, all material being furnished complete, for approximately 63 cents a foot.

The receiving tank or specialty, of which there are quite a number on the market at the present time, is placed at the side of the boiler. This is generally equipped with a gauge, which is marked off in ounces from the zero to sixteen. The water line is the same in boiler and receiving tank, which has an opening at the bottom with connections to the system return at the boiler. As this receiver is always open to the atmosphere, there is a free circulation of water from boiler to receiver and from receiver to boiler. The main return of the system is connected into a water seal at the top of the receiver, and all condensation from the entire system is returned into the open receiver and through that into the boiler.

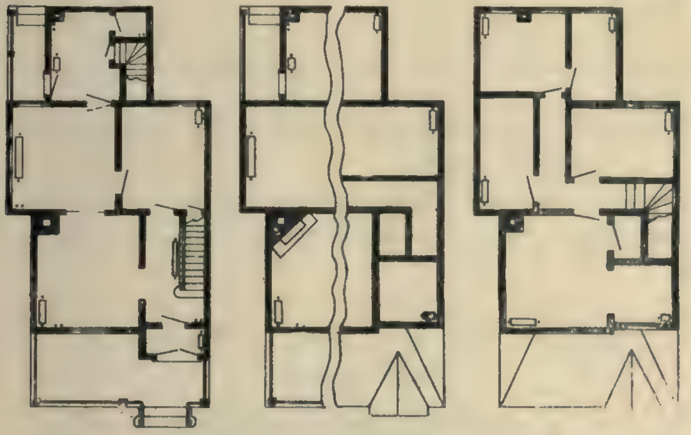
With most systems it has been found the most satisfactory way when installing the system to carry the air line from the top of the receiver into a condensing coil,



Basement Pipe Plan.

instead of direct to the flue. By so doing the condensing coil creates a draught and draws all the air from the system, at the same time drawing vapor into the radiator. There is a relief valve with a heavy copper float, which will generally operate at from four to six ounces pressure, placed in a connecting line from the steam space on the boiler to the top of the receiver, so that, any time more than a sufficient amount of vapor is generated, the pressure of this vapor will raise the float and allow the surplus vapor to pass into the receiver, thereby condensing same and venting the particles of air to the atmosphere. The receiving tank is equipped with a tight fitting drum or float, which is regulated by the amount of vapor used by the system, which averages from two to three ounces. This drum or float has connecting chains to the draft and check door and regulates them at the slightest depression, caused by the using of more or less vapor. The above is a practical means of securing fuel economy.

The diagramic throttle valves are arranged with a number of holes of various sizes. The sizes of these holes are governed by the size of the radiator to which it is to be connected. This valve is connected to the top of the radiator for convenience sake, while the old style valves are at the bottom of the radiator. The throttle can be so set as to heat the entire radiator or only a portion of it.



1st Floor Radiator Plan.

2nd Floor Radiator Plan.

The condensing coil varies in size according to the quantity of variation installed. From the top of the condensing coil at the opposite end from which the connection is made from the receiver, an air line is taken direct to the chimney, as it is natural for warm air to rise. This helps to create a draught in the flue and tends to make a vacuum throughout the entire system.

The following is a comparison of vapor system with the ordinary steam and hot water heating:

Hot water system requires a large quantity of water and the consumption of much fuel to heat it. The hot water radiator, which becomes cracked and leaks, would cause much damage to walls, side of same and ceiling below. If a hot water system is operated under pressure, there is great danger of an explosion; if open to the atmosphere, the pipe lines must be many sizes larger. A compression air vent is used to vent the air, which sometimes is left open by mistake, and the surrounding decorations are ruined by a forcible stream of water.

With the vapor system there are none of the above faults, as the boiler and receiver require only enough water to fill the water line, which, of course, requires only a small amount of fuel; vapor can be drawn through a cracked radiator or one with a small hole in it without causing the slightest damage to any surrounding decoration. The author has in mind at the present time a system which is being operated under the above conditions very satisfactorily. There is no pressure to contend with, as the operation is effected by means of natural conditions. There is no danger on account of an explosion, as the system is open to the atmosphere.

An ordinary steam system requires from one to five pounds pressure under modern conditions; and with it there is sometimes a most distressing noise, such as a nerve jarring rattle or a thump in the steam pipes and radiators, caused by the live steam coming in contact with the cold water. It is impossible to regulate a steam system perfectly, as it is either too hot or too cold. The majority of steam systems cause their owners much trouble and require considerable attention.

With a vapor system, which operates under only a few ounces pressure, the operation is noiseless, and the system requires little attention and furnishes the heat always just right throughout the entire building. When there is regulating of the heat to be done, the individual will operate the valve on the radiator in the room which he occupies.

It should be understood in studying the above described system that vapor requires 30 per cent. more radiation than steam, and 30 per cent. less than hot water. The following data will be found very useful to any contractor or practical builder in checking and approving work done under sub-contract. It has been used many years by prominent heating engineers and has been found very satisfactory. Same is quoted from standard authority, but is not guaranteed:

Sizes of Chimneys.

Hot Water	Steam	Sizes, in.
450 ft. radiation	300 ft. radiation	8x 8
550 ft. radiation	450 ft. radiation	8x12
650 ft. radiation	450 ft. radiation	8x12
1,000 ft. radiation	600 ft. radiation	12x12
2,000 ft. radiation	1,200 ft. radiation	12x12
3,000 ft. radiation	1,600 ft. radiation	12x16
4,500 ft. radiation	2,300 ft. radiation	16x15
6,000 ft. radiation	4,000 ft. radiation	16x20

Square Feet of Heating Surface in Standard Wrought Iron Pipe.

In. in diam.	Length per sq. ft. rad., in.	In. in diam.	Length per sq ft. rad., in.
1	2.90	2½	1.32
1¼	2.30	3	1.09
1½	2.01	3½	.95
2	1.61	4	.84

Sizes of Expansion Tanks.

Sizes	Gal. cap.	Rad., in.	Sizes	Gal. cap.	Rad., in.
10x20	8	250	16x36	32	1,300
12x20	10	300	16x48	42	2,000
12x30	15	500	18x60	66	3,000
14x30	20	700	20x60	82	5,000
16x30	26	950	22x60	100	6,000

Sizes of Steam Mains.

Direct rad., sq. ft.	1 pipe work, in.	2 pipe work, in.	Direct rad., sq. ft.	1 pipe work, in.	2 pipe work, in
130	1½	1¼x1	2,000	5	4½x4
260	2	1½x1¼	2,600	6	5 x4½
420	2½	2 x1½	3,700	7	6 x5
660	3	2½x2	5,200	8	7 x6
900	3½	3 x2½	6,900	9	8 x6
1,200	4	3½x3	8,500	10	9 x6
1,600	4½	4 x3½			

Sizes of Hot Water Mains.

Direct rad., sq. ft.	Pipe, in.	Direct rad., sq. ft.	Pipe, in.
100 to 130	1¼	960 to 1,250	4
130 to 200	1½	1,250 to 1,600	4½
200 to 325	2	1,600 to 1,950	5
325 to 410	2½	1,950 to 2,400	5½
410 to 750	3	2,400 to 3,000	6
750 to 960	3½		

An Interesting Departure in Chimney Construction

The accompanying illustration represents a concrete chimney recently built at Belmont, Ont., for Mr. F. Hamlyn, by Ira Peer, contractor. The chimney is 75 feet high and has a flue 40 inches in diameter. The walls are 15 inches thick at the base, gradually reducing in thickness toward the top, at which point they are only 4 inches thick. The chimney was built in 15 days, without the use of scaffolds. It is constructed entirely of concrete, the proportions being 1 part of cement to 8 parts of gravel. The Landon adjustable patent silo curbs were used in the work of construction. These curbs enable one to build any round tank from 3 feet in diameter to 30 feet in diameter, and to build a round structure with vertical walls on the inside, tapered on the outside, to any desired taper.

Concrete Chimney at Belmont, Ont.

An exchange gives the following recipe for hardening cast iron: To one gallon or a little more of water add one pound of strong concentrated sulphuric acid and one ounce of nitric acid; heat the cast iron to a cherry heat and place in the solution.

Publications and Catalogues

The Beller Water Heater Company, 311 Water St., Pittsburg, Pa., have issued a booklet regarding their automatic thermostatic instantaneous water heater and other apparatus. The booklet is well illustrated and shows that the company's products are well made and attractive in price.

The S. Knechtel Wood Turning Company, Southampton, Ont., have issued an attractive catalogue of their mouldings and turnings. The catalogue is extensively illustrated and handsomely prepared, and should prove of much interest to all who make use of such articles. The company manufacture various kinds of mouldings, including compressed, plain and carved. The compressed mouldings are made from first and second-class dried lumber, and being carefully manufactured, are of splendid quality. The company carry patterns in stock, of white oak and birch as it runs for color. In plain mouldings they have a large variety of patterns, and can manufacture all kinds, and for all purposes. Their carved mouldings are carved in the solid wood. The catalogue shows only a few patterns. A great many other designs can be made. Any one interested in the mouldings and turnings will do himself a favor by writing to the company and mentioning the "Contract Record."

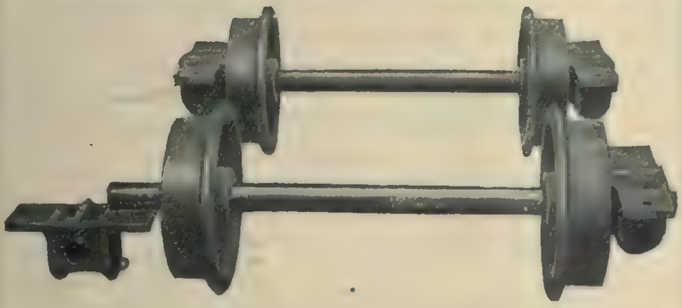
Those who appreciate the skilled productions of pencil and brush will be amply repaid by procuring a copy of the April number of "The Studio" (London: 44 Leicester Square). Canadian architects will always find something of interest in this publication. The present number contains an article entitled, "Recent Designs in Domestic Architecture." The designs, reproductions and reading in this connection are particularly good and he would be an efficient member of the profession who could find no suggestions therein worthy of consideration.

Method of Obtaining Bridge Tenders in New Ontario

The Public Accounts Committee of the Ontario Legislature is concerning itself over the method of getting tenders for bridges in New Ontario. Duncan Ross (West Middlesex) recently wanted to know whether the Government advertised for tenders, and A. W. Campbell, Deputy Minister of Public Works, gave evidence under oath before the committee. The sub-structure of large steel bridges was built by day labor, he said, and notices were sent to manufacturers of steel bridges throughout the Province for tenders in the superstructure. "Why not advertise?" asked Mr. Ross. "Because there are very few manufacturers of steel bridges in the Province. Notices bring the matter to their attention more quickly, and it is much cheaper," was the reply. The question of public buildings in the north country was also considered, contractor, the interests of the one must always be safe- and both Mr. Campbell and Dr. Reaume maintained that in most cases it was cheaper to do the work by day labor.

Mr. H. P. Rust, son of the Toronto city engineer, left for Florida last week after a brief visit to his parents. He had just returned from California, where he had installed an 80,000 h.p. electric plant to transmit electric power 120 miles to serve San Francisco. On his way to Toronto Mr. Rust passed through Mexico and prepared some reports on electric power possibilities for the New York firm in whose service he has been for some time.

Car Trucks



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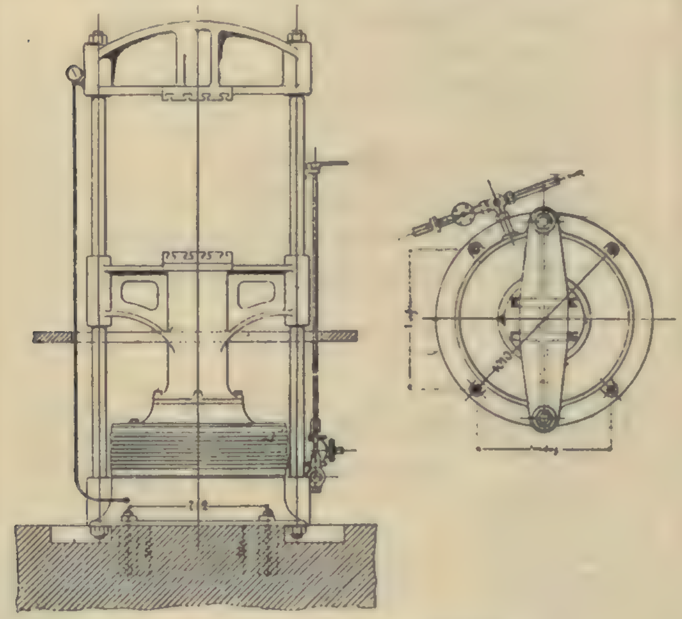
The Tatorinoff Pistonless Press

At a recent meeting of the Engineer's Club of Toronto, Mr. J. F. B. Vandeleur made the following allusion to the Tatorinoff Pistonless Press, illustrated herewith:

The Tatorinoff pistonless press or jack is new and introduces mechanical principles hitherto but little understood and that even now are scarcely credited. It requires no foundations and is easily portable; for instance, a press weighing about 430 pounds is able to exert a pressure from about 24 to 30 tons. The diagram illustrates the principle involved. The aim of the engineers to increase the power of a press by increasing the area of the piston upon which the working fluid acts has been foiled by the technical difficulties of constructing a cylinder of large diameter in which it was possible to keep a tight gland.



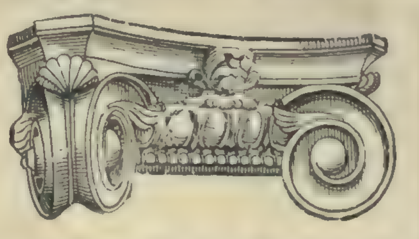
The Tatorinoff Pistonless Press.

The press invented by Tatarinoff has no piston whatsoever, and so the problem of increasing the power of a press by increasing the area upon which the working fluid acts is easily solved. Tatarinoff's press, speaking in general terms, consists of the following parts: A receiver, the sides of which fold like the bellows of a concertina; a moving plate, either top or bottom one, which bears round one of the pressing plates of the press, the second one being fastened to the stationary bottom plate of the receiver by steel columns which guide the moving top plate of the receiver. Water or air enters the receiver and by its pressure raises the top plate, with the result that an object may be pressed between the plate of the receiver and the upper pressing plate of the press. Having a large area the pistonless press transforms a small initial pressure into a great working pressure for all purposes for which presses are used.

The presses manufactured by the company in their latest forms have receivers, the folding sides of which consist of a rubbered canvas, as stated before, folding like the bellows of a concertina, and which can stand a pressure up to ten atmospheres to the square centimeter. The bottom plate of the receiver is connected with the pressing plate by means of steel columns. The top plate of the receiver has guiding rings. Thus the receiver is perfectly water-tight and air-tight. The water or aid is let through an ordinary tap or valve and let out likewise. There are no packing boxes in the press and consequently there is no danger of leaking.

Being of very simple construction and devoid of any complex parts Tatarinoff's press requires no skilled mechanic to work it or to look after it. This quality is of great importance in rural industries and in a number of small industries which cannot afford to employ a skilled engineer, also in those places which are situated at a great distance from any industrial centre where a skilled engineer could be obtained.

Requiring very small initial pressure, Tatarinoff's press can be worked by the pressure from an ordinary domestic water service. At outlying works and factories where there is no water installation ordinary gravity hydraulic pressure which can be used in cases of fire, and is stored for that purpose, is quita sufficient to work the press. Ordinary iron pipings are sufficient to connect it with the water tap, but where iron pipings cannot be obtained, rubber tubing enables one to place the press wherever desired, which cannot be said of those presses that are driven by shafts.



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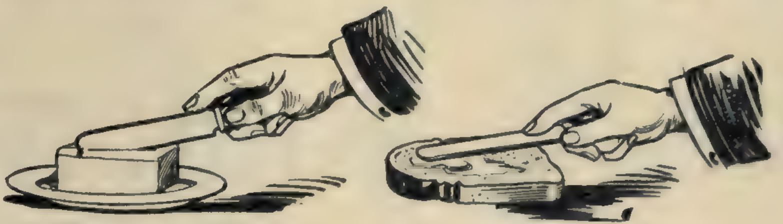

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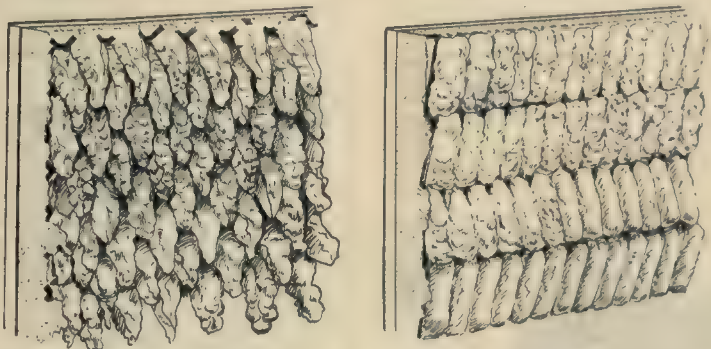
and you spread it with the *flat* of the knife.



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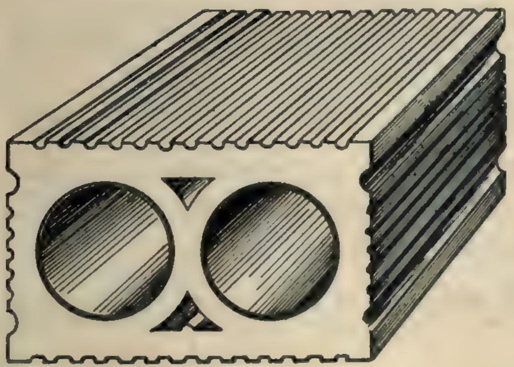

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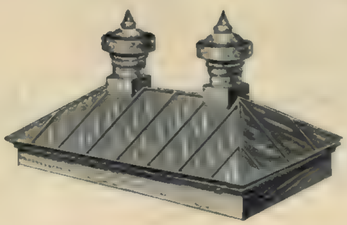

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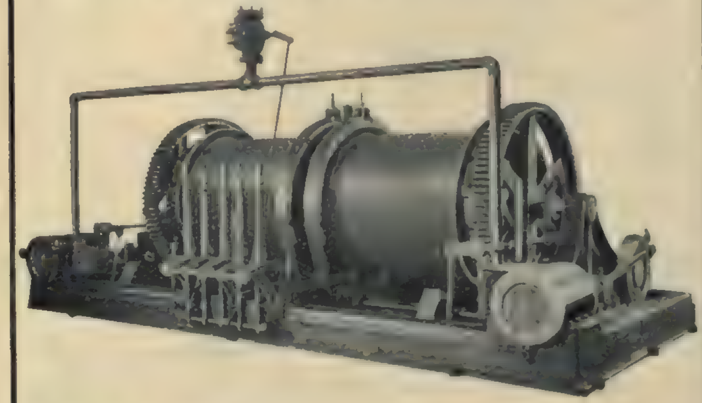

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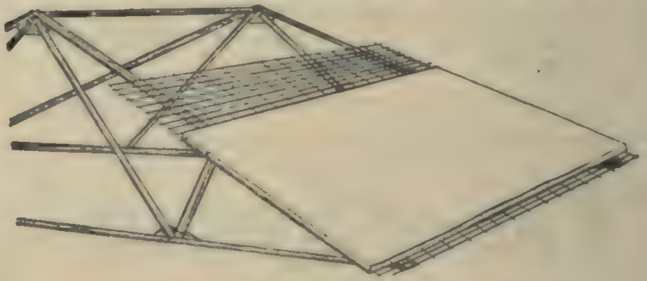

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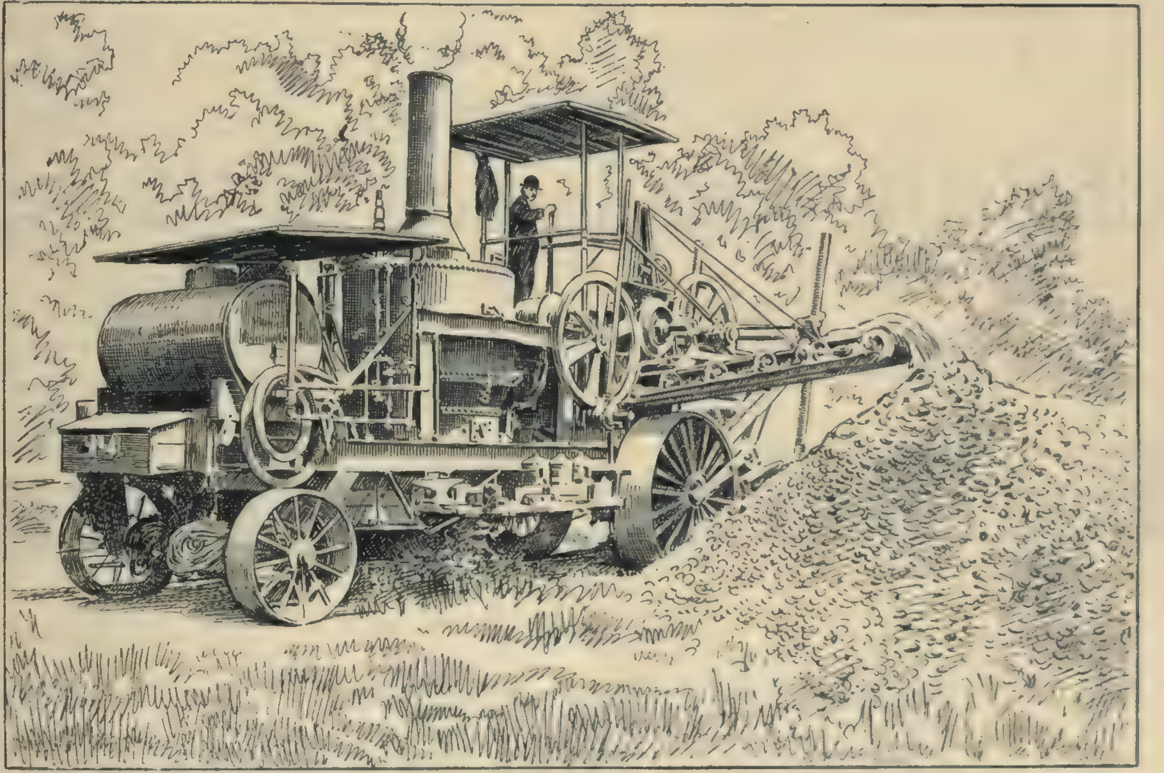

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Waterworks, Sewerage and Roadways

Aylmer, Ont.

Representatives of Ottawa, Hull and Aylmer met last week to discuss the installation of septic tanks at this place. Mayor Hopewell, on behalf of the Board of Control, offered to pay one-third of the cost, which has been estimated by Engineer Ker of Ottawa, at between $4,000 and $5,000. The matter is in abeyance.

Bloomfield, Ont.

Tenders addressed to C. H. Saylor, Clerk, will be received until May 15th for the purchase of $8,000, 4 1-2 per cent. good roads and concrete walks debentures.

Carleton Place, Ont.

A. R. Peden, Town Clerk, gives notice of the town's intention to carry out a number of concrete sidewalk projects as local improvements.

Fort William, Ont.

Tenders for grading are invited until May 7th by H. S. Hancock, City Engineer.

Hamilton, Ont.

Tenders addressed to S. H. Kent, City Clerk, will be received until May 27th for the following debentures: $65,000 for sewers; $112,000 for water works; $125,000 permanent roadways; and $25,000 public library debentures.

Kingston, Ont.

Tenders addressed to Mr. Eugene Fiset, Deputy Minister of Militia and Defence, Ottawa, and endorsed ''Tender for Water Supply, Royal Military College, Kingston,'' will be received up to the 15th of May. Plans and specifications, and all information, may be obtained at the offices of the Commandant, Royal Military College, Kingston, and the Director of Engineer Services, Ottawa, Ont.

Lethbridge, Alta.

The ratepayers will vote May 10th on a by-law to issue $44,500 30 years 5 per cent. local improvement debentures. Geo. W. Robinson, Secretary-Treasurer.

Mountain, Ont.

Tenders are requested by Mountain and Osgoode Townships for concrete work upon boundary road. Magoon & Walker, of Cornwall, Ont., are the engineers. (See advertisement.)

Moose Jaw, Sask.

The ratepayers have approved a by-law to raise $20,500 for construction of concrete and plank walks and pavements.

Merrickville, Ont.

The ratepayers will vote May 17th on a by-law to issue $10,000 20 years 4½ per cent. sidewalk and drainage and street improvement debentures. J. Johnston, Clerk.

Moncton, N.B.

The Board of Works is considering several water and sewer extensions, for which tenders will probably be called in the near future.

Niagara Falls, Ont.

The ratepayers will vote on May 27th to issue $1,800 debentures for sewer construction.

Sault Ste. Marie, Ont.

Tenders are being called by the city for cement concrete sidewalk. Plans prepared by W. I. Grante, C.E., Town Engineer. (See advertisement.)

Teeswater, Ont.

Tenders addressed to Charles Button, Clerk, Culross County, will be received until May 25th for making cement tiles and delivering same.

Toronto, Ont.

Water mains have been recommended for the following streets: Sunnyside avenue, from Geoffrey avenue to High Park boulevard; High Park boulevarde, from Roncesvalles avenue to Sunnyside avenue; Spadina road, from a connection with the six-inch pipe on Davenport road southerly; Dingwall avenue, westerly from pipe on Pape avenue; Lyndhurst avenue, northerly from pipe on Davenport avenue.

The city engineer has recommended the construction of 220 feet of four inch water main on Iroquois avenue, Centre Island, to supply water to the houses on Shawassi and Iroquois avenues.

Tenders for a slow-sand water filtration plant close May 18. Twelve covered filter beds, with an area considerably under an acre each, a covered clear water reservoir with a capacity of about 9,000,000 U.S. gals., seven sand washers of the ejector type, a pumping station and a laboratory are proposed. Concrete will be used for the filters and reservoir, including the groined arches for both. Reinforced concrete will be used for some hundred feet of 72, 54 and 36 inch pipe, 6, 5 and 4 inches thick, respectively. Plans and specifications for the work have been prepared by Hazen & Whippel, consulting engineers, 103 Park avenue, New York City. C. H. Rust, City Engineer, Toronto.

Vancouver, B.C.

With a view to ascertaining the relative cost of contract and day labor the Board of Works have decided to take tenders for five miles of cement sidewalks.

Victoria, B.C.

W. J. Dowler gives notice of the city's intention to carry out as local improvements the construction of permanent sidewalks on Boyd street, Burnwood road and Toronto street.

In response to a request for the approximate cost of bitulithic work, the Warren Construction Company, of Portland, at a recent meeting of the Council stated that if they bid on the Linden avenue work the prices would not exceed the following;—Bithulithic pavement on a bituminous base, six inches in depth, $2.75 per square yard, provided the finished grade follows generally the present lay of the ground; curb, 40 cents per lineal foot; sidewalk, 20 cents per square foot; boulevard, 50 cents per lineal foot. If any excavation or filling was required the prices would be 30 cents per cubic yard for scraper work, 60 cents for wagon haul and 80 cents for gravel fill. It was decided that Douglas street should be paved with bithulithic, as the property owners asked. To overcome the difficulty that the city cannot pay more than $15,000 under any one local improvement bylaw, the work will be done as two schemes, one embracing from Humboldt street to Yates street, and the other from Yates street to Herald street. Alderman Henderson asked the bithulithic people if brick between and on the outside of the tracks was not better than wood blocks Mr. Shannon replied that there was nothing to equal stone or brick grouted with cement. The City Engineer will prepare estimates.

Yorkton, Sask.

Tenders are asked for construction of sewers. Plans were prepared by Town Engineer J. T. McArthur. (See advertisement.)

Welland, Ont.

Tenders addressed to W. H. Crowther, Mayor, will be received until May 10th for the construction of concrete walks.

Waterloo, Ont.

Tenders addressed to S. F. Kumpf, Secretary, Sewer Comimssion, will be received until May 10th for construction of sewers on Victoria, Foundry and Erb streets. Plans and specifications at office of Chas. Moogk, Town Engineer.

Windsor, Ont.

The ratepayers will vote on May 10th on a bylaw to issue $6,642 local improvement, and $9,000 public park debentures.

AWARDED.

Saskatoon, Sask.

Three contracts for sewer and water have been let and operations will begin at once. Section one went to H. Welsh for $13,725; section two, R. Bolton, $17,900; section three, W. Cook, $9,756.25.

St. Thomas, Ont.

The contract for the year's cement work has been awarded by the city to A. E. Ponsford. A. E. Ponsford's figures were 10 cents for cement walks, sand finish; 12 cents for cement walk, granite finish; curbing, 23 cents a lineal foot; curbing and gutter, 38 cents, and curbing with walk, 10 1-2 cents. G. A. Ponsford's tender was 10 3-4 cents for sand finish walks; 13 cents for granite finish; 26 cents for curbing; 36 cents for curbing and gutter, and 11 cents for curbing with walk.

Railroads, Bridges and Wharves

Arnprior, Ont.

A deputation recently waited upon the Government to ask for the construction of a new wharf on the Ottawa river at Arnprior. Consideration was promised.

Blind River, Ont.

A deputation from this place recently waited upon the Department of Public

Works to ask for the construction of a new bridge across the river. Nothing definite was promised.

Chatham, Ont.
The C. W. & L. E. Railway are contemplating the construction of an extension to Erie Eau this season.

Edmonton, Alta.
Mr. E. J. Chamberlin, general manager of the G. T. P., states that by next autumn the G. T. P. will have 1,365 miles of completed road. Every bridge between Edmonton and Winnipeg has been completed, and the track is now being laid on the last fifty miles, which constitutes the one gap between the two cities. This work will be pushed rapidly, and Mr. Chamberlin says there is little doubt as to the road being completed by June from the Red river to Saskatchewan. Fifty stations are now under construction between Winnipeg and Wainwright. Mr. Chamberlin also announces that during the coming summer some 200 miles of branch lines in Alberta and Saskatchewan will be completed.

Fort Frances, Ont.
It is stated that the Canadian Northern is contemplating rebuilding its bridges and relaying its tracks east of Fort Frances this season.

Montreal, Que.
Plans have been completed for the new wharf to be built by the Harbor Commissioners at Longue Pointe, and have been forwarded to Ottawa for the consideration of the Department of Marine and Fisheries and approval of the Governor-in-Council. The wharf will be built of concrete and will be 450 feet in length.

O'Connell, Ont.
Tenders addressed to W. M. Shields, Clerk, Township of Rama, will be received until May 15th for steel superstructure and concrete abutments for a bridge to be constructed over the Severn river. Plans and specifications at office of W. M. Shields.

Ottawa, Ont.
The Kootenay & Alberta Railway Company is seeking a charter for important extensions in South East Kootenay and Southern Alberta.

The Railway Committee have passed the G. T. P. branch lines bill, authorizing additional extensions from Pembina Crossing to Embarrass river, and thence to the Little Pembina river, 100 miles from Embarrass river, to the McLeod river, 25 miles from near Calgary to McLeod, and then to the western boundary of Alberta, 100 miles, and from Regina to Moose Jaw, 45 miles. The Thessalon and Northern Railway Bill, authorizing a line from Thessalon to the "Soo" branch of the C. P. R., was also passed.

Prince Rupert, B.C.
The Provincial Government will in all probability construct a public wharf here, to be located on Section F of the waterfront, held by the Government. It is proposed to build a wharf on cement piles, at an estimated expenditure of $60,000.

Port Arthur, Ont.
Janse and McDonnell, of Lethbridge, Alta., have secured the contract for the construction of the C. N. R. cut-off at Stanley Junction, west of Port Arthur. The work is 10 miles in length and involves the moving of about 300,000 cubic yards of earth and rock.

St. Andrew's Ont.
The C. P. R. will build a new wharf at this place, construction to be commenced at once. The wharf will be 200 feet in length, and will cost $20,000. William Downie, General Superintendent.

Strathcona, Alta.
Plans have been prepared by City Architect McLean for the proposed bridge over Mill Creek, at the end of Whyte avenue. Estimated cost, $5,000.

Toronto, Ont.
The plans for the construction of the proposed railway viaduct are now in the hands of Mr. George A. Mountain, engineer of the Board of Railway Commissioners, and upon his report will be issued the order directing the railway companies to proceed with the work.

Vancouver, B.C.
The C. P. R. officials have under consideration plans for the construction of another jetty wharf, to be built out into the inlet from the eastern end of No. 2 shed.

Victoria, B.C.
It is stated that $310,000 is to be expended upon the E. & N. railroad system this season. The appropriations for the island line were recently received by H. E. Beasley, the superintendent. They are divided into two large sums for a similar number of specific purposes. $190,000 will be laid out in general maintenance while about $120,000 is to be spent in the construction of a new cantilever bridge over the Niagara canyon, a gully on the main line, situated about 15 miles from this city.

Winnipeg, Man.
D. D. Mann, vice-president of the Canadian Northern Railway, states that his company will spend more than an average of $1,000,000 a month during the remainder of the year on new construction. In addition, rolling stock to the value of $3,000,000 will be purchased. In all the company will build approximately 400 miles of new track in western Canada this year, including a portion of the line westward from the Rocky Mountains to the Pacific coast, surveys for which are now being made.

AWARDED.

St. Boniface, Man.
The Manitoba Bridge & Iron Works, Limited, have obtained from the general contractors, Messrs. Haney, Quinlan & Robertson, the contract for the whole of the structural steel in the new Transcontinental Railway shops at St. Boniface, amounting to nearly 5,000 tons. This is the largest contract for structural material that has been given in Canada this year, the contract price being in the neighborhood of $350,000. Their new bridge shop on Logan avenue west is being rushed to completion and the fabrication of this material will commence about June 1st.

Vancouver, B.C.
The contract for the draw span for the bridge over Cambie street has been awarded to Armstrong & Morrison at $3,500.

Toronto, Ont.
Farrell & McCarthy, this city, have been awarded the contract for a $5,000 trestle Grove, near Toronto, for the Dovercourt Land Company, 24 Adelaide street east. The bridge will be of wood, on concrete. Engineer, W. S. Brooks, 24 Adelaide street east.

Edmonton, Alta.
The City Council has awarded to the Edmonton Heating and Plumbing ompany the contract for the supply of 77,000 feet of sewer pipe. Contract price, $32,161.

Public Buildings, Churches, Schools, etc.

Arnprior, Ont.
Tenders addressed to M. D. Graham, Secretary, Board of Education, will be received until May 18th for remodelling and enlarging the Arnprior high school. Plans and specifications may be obtained of C. A. R. Dulmage, Arnprior.

Brandon, Man.
Tenders for the new C. N. R. depot will be called for at once.

Brantford, Ont.
The ratepayers have approved a bylaw to raise $95,000 for a new collegiate institute. The work will be undertaken this summer.

Burnside, Man.
Tenders are being taken for the erection of a frame Presbyterian church at this place. Address D. McCowan.

Canning, N.S.
Tenders addressed to R. W. North will be received until May 15th for the erection of a Methodist church at this place.

Clayton, Ont.
Tenders addressed to John Oates, Clayton, Ont., will be received until May 10th for the erection of a brick school for S.S. No. 2, Ramsay.

Collingwood, Ont.
The ratepayers will vote May 26th on a by-law to issue debentures to raise $7,000 for the erection of an agricultural exhibition building.

Cote du Lac, Que.
Architect Joseph Venne, 402 Plessis street, Montreal, has prepared plans for the erection of a church at Coteau du Lac. Rev. Faubert, Coteau du Lac, will receive tenders for the building.

Edmonton, Alta.
H. A. Magoon, architect, this city, has prepared plans for a new Methodist church, of stone and brick construction, to cost $90,000.

Elora, Ont.
The Council is taking steps to secure the Carnegie library building and site.

Tenders addressed to T. K. McQueen will be received until May 8th for re-roofing Knox Church.

Fort William, Ont.
The Methodist church at this place is to be remodeled and enlarged

Galt, Ont.
The ratepayers have approved by-laws to raise $20,000 for enlarging the Galt hospital and $15,000 for the extension of the Central school.

Georgetown, P.E.I.
The Department of Public Works at Ottawa is calling for tenders for heating apparatus for the public buildings at this place. Plans and specifications may be obtained from the Department or from M. E. McPhee, Clerk of Works, Georgetown. Tenders close May 10th.

Govan, Sask.
A fire hall with city offices adjoining will shortly be erected.

Hanover, Ont.
Tenders will be received by J. H. Adams until May 13th for all trades required in the erection of a bank building at Hanover. Plans and specifications can be seen

at the Merchants Bank, Hanover, or at the offices of Forster & Clark, architects, Owen Sound, Ont.

The Evangelical Association of Mildmay have decided on building a new church at a cost of about $6,000.

Keewatin, Ont.

Tenders addressed to the Secretary-Treasurer, Public School Board, will be received until May 10th for the erection of an addition to the public school. Plans and specifications may be obtained at office of Secretary-Treasurer, Keewatin, or of W. Fingland, architect, 317 Portage avenue, Winnipeg.

Kincardine, Ont.

Tenders addressed to W. A. Quinn will be received until May 14th for the erection of a hospital building.

Kingston, Ont.

The Finance Committee will grant the Board of Education $4,000 for the gymnasium for the collegiate institute.

The Department of Militia and Defence is calling for tenders for improvement of Royal Military College. (See advertisement.)

Lachine, Que.

The contract for the reconstruction of the Roman Catholic Church at Lachine has been awarded to Labelle & Lessard, contractors. Alphonse Content, 17 Place d'Armes Hill, Montreal, architect.

Merlin, Ont.

A new public school will be built at this place.

Moose Jaw, Sask.

The ratepayers have approved a by-law to raise $42,000 for the completion and equipment of the collegiate institute.

Montreal, Que.

The Metropolitan Golf Club House, owned by the city, was destroyed by fire last week at a loss of $9,000.

MacVicar & Heriot, architects, have just taken tenders for the erection of a school for the Verdun School Commissioners.

Jas. B. Adamson, architect, Coristine Building, has prepared plans for the erection of a new structure to replace the old Congregational church.

Brown & Vallance, architects, have prepared plans and are inviting tenders for the erection of a Cottage Ward for the Children's Memorial Hospital.

J. A. Karch, architect, 17 Place d'Armes Hill, is inviting tenders for plumbing, heating and roofing of a school at the corner of St. Denis and Beaubien streets.

Mr. E. H. Fitzhugh, of the Grand Trunk, announces that work will be begun at once on the Grand Trunk Station at Ottawa. The cost of the building will be about a million dollars.

Mitchell & Crighton, architects, have prepared plans for the erection of a Greek Church on St. Lawrence Boulevard, to cost $7,000. Tenders to be submitted to Mr. Pulos, of Cockels & Pulos.

The Canadian Athletic Club, at a recent meeting decided to increase their capital stock from $20,000 to $90,000, for the purpose of erecting a large club house in a central portion of the city. The club has several good sites in view, and it is likely that the present plans will go through.

New Lowell, Ont.

Tenders are invited until May 12th for cementing, brick work, carpentry, painting, heating and tinsmithing for Presbyterian church. Address J. B. Ketchen, Secretary Building Committee.

New Hamburg, Ont.

The Baptist congregation will proceed with the erection of a new church.

North Bay, Ont.

Tenders addressed to H. S. McNaughten, Secretary, Department of Public Works, Toronto, will be received until May 15th for equipment of Normal School at North Bay, including opera chairs, opera seats, combination seats and desks, lockers, tables, etc. Plans and specifications may be seen at office of Clerk of Works, Normal School building, North Bay, and at the office of the Department, Parliament Buildings, Toronto.

Oakver, Man.

D. S. Anderson, architect, Hamiota, Man., has plans for a new church to be erected here.

Oak River, Man.

A new church will be erected here. D. S. Anderson, architect, Hamiota, Man., has prepared plans.

Ottawa, Ont.

The Protestant Orphans' Home will be renovated at a cost of $2,000.

The congregation of St. Bartholomew's Church, will erect a new church on Buena Vista Road, Rockcliffe, on a site which has been donated for that purpose.

Prince Albert, Sask.

The City Council may ask Mr. Carnegie to donate $15,000 for a library building.

Tenders addressed to the Minister of Public Works, Victoria, B.C., will be received until May 27th for the erection of a two storey and basement frame school at Prince Rupert. Plans and specifications may be seen at the offices of the Government Agent, Prince Rupert, the Provincial Timber Inspector, Vancouver, and at the Department. E. Criddle, Supervising Architect, Public Works Department.

Regina, Sask.

It is rumored that the C. P. R. will build a large depot in this city.

Saskatoon, Sask.

The Nutana school board will build a new eight room school at a cost of about $30,000. The plans of W. W. La Chance were accepted and excavating will commence at once on the site.

St. George, Ont.

Tenders addressed to M. Horning will be received until May 10th for frescoing the Methodist Church.

Stratford, Ont.

Tenders addressed to J. C. Monteith will be received until May 12th for an addition to the collegiate institute. J. S. Russel, this city, architect.

Springhill, N.S.

L. R. Fairn, of Aylesford, N.S., is preparing plans for a new school at this place.

Toronto, Ont.

It is stated that the additions to the General Post Office will be commenced in a few weeks. The plans provide for a three storey stone and brick building to the east of the present structure. Estimated cost, $50,000.

Plans are progressing for the establishment of a Young Women's Catholic Association and Guild. It is estimated that a suitable building could be erected for $25,000. The project has received the endorsation of all the Catholic clergy.

Vancouver, B.C.

The congregation of Trinity Church is purchasing a lot on Tenth avenue as a site for a new building.

Victoria, B.C.

The Victoria Country Club will spend $15,000 in improvements at Willows Track.

Tenders addressed to Evered Criddle, Supervising Architect, Department Public Works, Victoria, will be received until May 20th for the erection and completion of a frame school building at Saanich. Plans and specifications at the Department.

Tenders addressed to the Minister of Public Works will be received until May 31st for the erection of a Hospital for the Insane, a reinforced concrete and brick building at Coquitlam Farm. Plans and specifications may be seen at the Department and at the offices of the Government Agent, New Westminster, and the Provincial Timber Inspector, Vancouver.

Welland, Ont.

The ratepayers will vote May 17th on a by-law to issue $10,000 4½ per cent. 20 years' school debentures. George R. Boyd, Clerk.

The congregation of Holy Trinity are considering extensive improvements. They may decide upon the erection of a new church.

Wingham, Ont.

Tenders addressed to J. S. Groves, Secretary, Public School Board, will be received until May 11th for remodelling steam heating system in public school. Plans and specifications may be seen at offices of Alex. Ross, Wingham, and W. E. Binning, architect, Listowel.

Winnipeg, Man.

Tenders will shortly be called for the new River Heights club house.

The Methodist Board will erect a $15,000 building for the Stella avenue mission on Powers street.

Architect Melville is preparing plans for a yacht club house at Dunottar Point, Lake Winnipeg.

A permit has been issued for the new school room to be added to Augustine Church, Fort Rouge. Estimated cost $3,000. J. H. Russell, architect. Malcolm Bros., contractors.

Work is to be commenced at once on the new addition to St. Mary's Academy, Winnipeg. The building will be four storeys high, of brick construction and will cost $80,000.

In all probability a large wing, to cost $200,000, will be built to the Kennedy St. court house, Winnipeg. It is understood that work on the structure will be commenced in the early summer.

AWARDED.

Fernie, B.C.

The Fernie Construction Company, at $37,978, are the successful tenderers for the new school building.

Montreal, Que.

The Laurin Construction Company, 112 St. James street, general contractors for the additions to the Hotel Dieu Hospital, have awarded the contract for tiling work to Hamon & Hess, 207 St. James street.

The general contract for the erection of a new armoury for the 65th Battalion Carbineers on Pine avenue, has been awarded to Martineau & Prenoveau, contractors. R. A. Brassard, architect, 9 St. James street.

The general contract for the erection of the new Protestant Infants' Home on Cote des Neiges road, has ben awarded to John

Stewart & Company, general contractors, Westmount. Hutchison, Wood & Miller, architects, Royal Insurance Building.

A. E. Patton, representing the H. W. Johns Manville Company, N.Y., has secured the contract for laying underground conduits and pipe coverings for the new power building, McGill University. Prof. E. Nobbs, architect. Byers & Anglin, general contractors.

The Catholic School Commissioners have awarded the contracts in connection with the new school to be erected at Point St. Charles. The contract for the carpentering work went to Joseph Jacobs at $9,170; the masonry to A. Filion Bros., at $5,075; plumbing, heating and roofing to Cadieux & Briand, at $7,111; painting and glass work to Bruno & Navert, at $1,585, and the iron work to the Dominion Bridge Company at $2,651. Tenders for the brick work were received, but not decided upon. In regard to the electric light installation new tenders are to be called for.

G. A. Monette, architect, 97 St. James street, has awarded the contracts for the erection of a girl's school in Notre Dame de Grace, as follows: Masonry, Alphonse Charette; brick, Stanislas Rochon; carpentry, Z. Leroux; plastering, A. Fisson; paintinfi, A. Wilson; electrical work, Mr. Renaud; plumbing, heating and roofing, T. Lessard & Son; structural steel, Phoenix Bridge Company.

Out of 28 tenders submitted for the erection of the new Technical School on Sherbrooke street, only ten were accompanied by the specified certified cheque required; and the following seven firms' cheques were returned as their tenders were too high: John Quinlan & Company, E. G. M. Cape, Martineau & Prenoveau, Damien & Lalonde, Thos. Wand, Joseph Bourque, and J. H. Hutchison. The cheques of Peter Lyall & Sons, C. E. Deakin, and Geo. W. T. Nicholson were retained. It is reported (unofficially) that Peter Lyall & Sons have been awarded the general contract.

Notre Dame de Grace, Que.

Finley & Spence, architects, Guardian Building, have awarded the general contract for the erection of a new schol building on Royal avenue for St. John's school, to Geo. W. T. Nicholson, 301 St. James street, Montreal. Carpentry work let to D. M. Long, Windsor street, Montreal.

Oak River, Man.

The contract for the new school building has been awarded to C. Cleland.

Outremont, Que.

James E. Adamson, architect, Coristine Building, has awarded the contract for the repairs and atlerations to the Town Hall, Outremont, to Wm. Evely, contractor, Montreal.

Richibucto, N.B.

The contract for the new school building has been awarded to Mr. Lutz, of Sussex, N.B., at $7,000.

Stratford, Ont.

Contracts for the Shakespeare Ward school addition have been awarded as follows: Masonry, Geo. Weber, $6,824; carpenter work, Wm. Elligsen, $4,215; plastering, E. Stephen, $460; plumbing and heating, McDonald & Henry, $2,227; sheet metal work, J. R. Myers, $480; painting and graining, A. E. Cash, $512; total, $15,100.

Shoal Lake, Man.

The tenders for the building of the new Presbyterian church were opened last week and the contract awarded to E. R. Snider, whose figure of $7,750 was the lowest. Four tenders were received as follows: E. R. Snider, $7,750, without seating; Fusee & McFeetars, Neepawa, $8,330, without seating; Findlay & Short, $9,101, with seating; Richie & Waters, Portage la Prairie, $7,961, without seating.

Verdun, Que.

MacVicar & Heriot, architects, Montreal, have awarded the general contract for the erection of a school for the Verdun School Commissioners, to Gray & Wighton, contractors, 7 Park avenue, Montreal.

Residences

Montreal, Que.

John James Browne, architect, 207 St. James street, has prepared plans for the erection of four houses for the Sterling bridge to be erected on Yonge street, Glen Realty Company on Sherbrooke street west.

G. A. Monette, architect, 97 St. James street, is preparing plans for the erection of a residence in the Montreal Annex for Mr. J. E. Goodwin.

Outlook, Sask.

C. A. Mercer will shortly commence the erection of a $5,000 residence.

Ottawa, Ont.

Weeks & Keefer, architects, this city, are preparing plans and will be inviting tenders for the erection of an apartment house.

H. C. Stone, architect, Montreal, is taking tenders for the erection of an apartment house for the Imperial Realty Company.

Toronto, Ont.

F. H. Herbert, architect, 65 Adelaide street east, has prepared plans for a two and a half storey residence and garage to be erected in Parkdale for Mr. Geo. Rathbone, Heathcote avenue. The building is to be of stone construction and will cost $15,000.

F. H. Herbert, architect, 65 Adelaide street east, will erect a three storey apartment building on Queen street, near Church street, at a cost of $50,000. The building will be of pressed brick and stone construction.

Langley & Howland, architects, Bay and Richmond streets, have prepared plans for a three storey brick apartment building, at 291 St. George street, for Mrs. E. D. Y. Cohen, 147 Farnham avenue.

Leonard Foulds, architect, 45 Victoria street, has prepared plans for a two and a half storey residence to be erected on Brunswick avenue, near Dupont street, for Dr. Slade, corner Queen and Bathurst streets. It will be of brick construction and will cost $5,000.

J. Hunt Stanford, architect, has prepared plans for three pairs of two and a half storey semi-detached dwelilngs to be erected on Hepbourne street, near Rusholme road, for Mr. J. G. Kent, 34 Yonge street arcade. Estimated cost $12,000.

J. H. Galloway, architect, 77 Victoria street, has prepared plans for a two and a half storey dwelling to be erected on High Park avenue, West Toronto, for Mr. R. J. Bruce of that place. The buildings will be of brick construction and will cost $5,000.

Westmount, Que.

Plans are being prepared for the erection of a residence for Mr. P. Gillespie. Mr. G. A. Monette, 97 St. James street, Montreal, is the architect.

Alterations will be made to the residence of Mr. R. Egan. Saxe & Archibald, architects, Montreal, are preparing the plans.

Plans are being prepared for the erection of a residence in Westmount for Mr. W. A. Tooke, by Saxe & Archibald, architects, 59 Beaver Hall Hill, Montreal.

Saxe & Archibald, architects, 59 Beaver Hall Hill, Montreal, are preparing plans for the erection of a residence in Westmount, for Mr. David Morrice.

Winnipeg, Man.

Tenders are invited by Architect Rugh for all trades in the erection of a residence for A. F. Osler.

S. M. Burbridge has a permit for an $8,000 dwelling on the north side of Harvard. W. W. Scott, contractor.

C. R. Hegan will build a $6,000 dwelling on the north side of Yale. W. W. Scott, contractor.

A permit has been issued to A. N. McPherson for a $7,000 dwelling on Balmoral Place. W. W. Scott, contractor.

AWARDED.

Montreal, Que.

Peden & McLaren, architects, 20 St. Alexis street, have awarded the contract for the erection of a residence in Montreal West for Mr. Alexander Peden, jr., to Byers & Anglin, general contractors.

The contract for the alterations to the stable and residence of Mr. R. D. McGibbon has been awarded to James Morison.

E. & W. S. Maxwell, architect, 6 Beaver Hall Square, have awarded the general contract for the erection of a three storey residence on McGregor street, for Mr. James Crathern, to J. H. Hutchison, general contractor, Bourget and St. Ambroise streets. Cost $12,000.

Robert Findlay, architect, 10 Phillips Place, has awarded contracts for the excavations, masonry, brick, rough carpentry and plastering, for the erection of a residence on Westmount Boulevard, Westmount, for Mr. S. J. Watson, to H. Trudeau, contractor, St. Laurent.

Peden & McLaren, architects, 20 St. Alexis street, have awarded the following contracts for the erection of two houses on Grosvenor avenue, Westmount, for Mr. J. T. Fisher: General contract, D. F. Deslauriers; electrical work, Century Electric Company; plastering, R. D. Clark & Sons; painting, T. M. Blackwood.

Outremont, Que.

E. & W. S. Maxwell, architects, Montreal, have awarded the general contract for the erection of a residence for Mr. C. P. Beaubien, to Reid, MacGregor & Reid.

Toronto, Ont.

Chas. J. Gibson, architect, 75 Yonge street, has awarded the fololwing contracts for a two and a half storey brick residence to be erected on Dunvegan road, near St. Clair avenue, for Mr. W. McLaughlin, 476 Huron street, at a cost of $10,000: Masonry, Elgie & Page; carpentry, P. B. Manuel; plumbing and heating, Bennett & Wright; painting and glazing, F. C. Davies; electric wiring, R. A. L. Gray.

Eden Smith & Son, architects, 199 Yonge street, have awarded the following contracts for a $9,000 brick residence to be erected on Clarendon Crescent, near Poplar Plains road, for Mr. E. B. Walker, 199 Yonge street: Masonry, T. Fussells; plumbing, T. J. Aggett.

Gordon & Helliwell, architects, Confederation Life Building, have awarded the following contracts for a two and a half storey $8,000 brick residence to be erected at

419 Bloor street east for Robt. Maybee, 126 Albany avenue: Masonry, Balderston Bros. & Hutchison; carpentry work, David McMurr; sheet metal work, G. M. Bryan; plastering, Hanna & Helson; electric wiring, and plumbing, Keith & Fitzsimmons; painting and glazing, Gould & Malcolm.

Simpson & Young, architects, 17 Toronto street, have awarded the following contracts for a two and a half storey residence to be erected on Broadview avenue, for Mr. W. T. Harris, Harris Abbatoir Company: Masonry, Elgie & Page; carpentry, Jas. MacKenzie; painting and glazing, J. Casey; tile work, Canada Palte Glass Company; electric wiring, G. G. Tughon & Company; structural steel work, McGregor & MacIntyre; sheet metal work and roofing, Wm. Saulter. Estimated cost, $10,000.

Vancouver, B.C.

Grant & Henderson, architects, have recently awarded the contract for a $25,000 residence for Mr. R. P. McLennan.

Westmount, Que.

Alex. F. Crosman, architect, 84 St. Francois Xavier street, Montreal, has awarded the following contracts for the erection of four houses in Westmount for Mr. W. L. Chipchase: Excavations, masonry and brick, John Stewart & Company; carpentry, D. H. Scott & Company; plumbing and heating, John A. Gordon; painting and glazing, Chris. Sonne; plastering, H. H. Fernald; roofing, Sibley & Huot; electrical work, Electrical Repair & Construction Company.

Business Buildings and Industrial Plants

Berlin, Ont.

Construction will shortly commence upon the new Ahrens shoe factory.

The construction of the new concrete factory to be erected by Witte Bros. & Company, Newark, N.J., will not be commenced until March, 1910.

Calgary, Alta.

Dowler & Michie, architects, this city, invite tenders for a two storey business building to be erected here for Mr. G. S. Mackie, of Banff.

George E. Wood will build a three storey business block on Eighth avenue.

Saskatoon, Sask.

Sheriff Calder will build a three storey and office block this season at a cost of $12,000.

Cobalt, Ont.

The North Bay House, North Bay Cafe, Victoria and Chicago restaurants and the Cobalt Bakery were destroyed by fire last week.

Englehart, Ont.

The school house and the Latimer & Morris building were destroyed by fire last week.

Edmonton, Alta.

J. E. Wize, architect, is preparing plans for a three storey brick and concrete block to be erected on Jasper avenue at a cost of $30,000. Tenders will be let shortly.

J. Dickson will make extensive alterations to property recently acquired from H. N. Dodge.

Hanover, Ont.

Tenders are requested for all trades in erection of bank building for Merchants Bank of Canada. Forster & Clark, Owen Sound, Ont., architects. (See advertisement.)

Hamilton, Ont.

Chas. Mills has been granted a permit for the erection of a three storey brick building on Jackson street for the Y. W. C. A. Estimated cost $36,000.

Lethbridge, Alta.

The Royal Bank is stated to have purchased a site for the immediate erection of a building.

A three storey business block will be erected here this season by Alderman Sheppard.

The Union Bank will erect a three-storey addition to their building.

A. H. Richards & Company will build a new block.

Liverpool, N.S.

The Elmhurst hotel was destroyed by fire last week at an estimated loss of $25,000.

Montreal, Que.

Jos. Sawyer, architect, 401 Guy street, invites tenders for the erection of a five storey warehouse on Commissioners street for Mr. Adolphe Racine.

Mitchell & Crighton, architects, Inglis Building, are inviting tenders in bulk for the erection of a theatre on Bleury street for Messrs. Blumenthal's.

Plans and specifications for the erection of a bank building for the Bank of Montreal, at Saskatoon, Sask., have been prepared by Messrs. Peden & McLaren, architects, 20 St. Alexis street, and are now on view. Bulk tenders will be received at the office of the architects up to the 11th of May.

Peden & McLaren, architects, are inviting tenders for the cleaning, repointing, etc., of the premises of the Bank of Montreal, Seigneurs and Notre Dame streets.

North Bay, Ont.

The buildings of D. J. McKeown and others were destroyed by fire last week. Estimated total loss, $70,000.

New Westminster, B.C.

The Brooks-Scanlon Lumber Company, of Minneapolis, Mich., which some time since announced its intention of erecting two or more large sawmills on the river is seeking a site close to the city for the first mill.

Ottawa, Ont.

It is understood that the report of the commission upon chilled meat and its exportation will file a report advising the establishment of large central plants and numerous feeders, refrigerator cars and cold storage depots at principal ports. The scheme, as outlined, will cost $5,000,000.

Building operations will probably be commenced in the near future in connection with a rope factory which Hon. C. M. Ramsay and Dr. Roughsedge, of this city, contemplate establishing.

Pembroke, Ont.

The ratepayers will vote on May 18th on a bylaw to loan $30,000 to the Lee Manufacturing Company.

Peterborough, Ont.

The ratepayers will vote June 1st on a bylaw in favor of Purity Ware, Limited, who wish to build a factory, 200 x 500 feet.

Prince Albert, Sask.

It is stated that tenders will shortly be called for the new penitentiary.

Quebec, Que.

The machinery factory of Paquet & Company was destroyed by fire last week at an estimated loss of $60,000.

St. Therese, Que.

G. A. Monette, architect, Montreal, is preparing plans for alterations and additions to stores at this place.

St. Hilaire, Que.

It is stated that Montreal capitalists are interested in a project to rebuild the Iroquois House at a cost of $200,000.

St. Thomas, Ont.

The Canada Iron Corporation Company, Limited, will make extensive improvements to their plant in this city.

J. G. Lang will build a two storey store on Talbot street this summer.

Sarnia, Ont.

The Williams Organ Company, of Chicago, may locate a branch factory here.

St. Mary's, Ont.

The ratepayers have approved a by-law to guarantee $40,000 six per cent. bonds for a term of five years to Dr. T. J. McNally, of Toronto, and J. G. Lind, of Owen Sound, who will form a company to manufacture rock cement in this town.

Three Rivers, Que.

Theo. Daoust, architect, 103 St. Francois Xavier street, Montreal, is preparing plans for the erection of a hotel in Three Rivers for Mr. Dufresne. All information to be obtained from Daoust & Lafont, architects, Three Rivers.

Toronto, Ont.

F. H. Herbert, architect, 65 Adelaide street east, has plans for a three storey brick factory to be erected on Clifford street for the Kindel Bed Company, of this city.

Plans have been prepared by P. H. Finney, architect, 43 Victoria, street, for a two storey planing mill to be erected on Osler avenue for the Watt Milling Company. Estimated cost, $20,000.

F. J. Bird, architect, has plans for a pair of two storey stores and dwellings to be erected on Queen street east for H. McCarten. Estimated cost, $5,000.

P. H. Finney, architect, 43 Victoria street, has plans for a pair of two storey stores and dwellings on Bathurst street for T. Harman, estimated cost, $6,000; also for a pair of stores and dwelilngs, corner of Danforth and Logan avenues, for T. McNea, estimated cost, $4,000; also for a brick store and dwelling on Roncesvalles avenue for Mr. J. S. Sharp, estimated cost $2,500.

J. H. Sanford, architect, 34 Yonge street Arcade, has plans for a $3,500 store and dwelling on College street, for J. Jamieson.

Plans have been prepared by J. H. Galloway, architect, 77 Victoria street, for a three storey store and apartment building on Bloor street for E. J. Jackson.

Plans are being prepared by W. Thompson, architect, for a pair of brick stores and dwellings for Mr. Carter. Estimated cost, $3,000. The same architect has plans for a pair of brick stores and dwellings corner of Ossington and Hallam avenues for the Tait Angus Company. Estimated cost $5,500.

Mr. Thompson, Commissioner of Industries, has submitted to the Board of Control an offer from the Toronto Furniture Company, now at Ramsden Park, for 200 feet of land on the east side of Dufferin street, below King, where they wish to erect a factory at a cost of about $75,000.

Plans are being prepared for three three storey brick stores and dwellings for Mr. J. B. Vick, 98 Riverdale avenue. Estimated cost $6,000.

(Continued on page 23)

Tenders and For Sale Department

Wanted

for the Town of Collingwood, a resident Engineer to take charge of Road Building, Side Walks, Sewerage, and all work of a similar nature. Applicants to state experience and salary expected.

J. H. DUNCAN,
18 Town Clerk, Collingwood.

Wanted

Professors of Civil, Mechanical and Electrical Engineering to the three Chairs in the Nova Scotia Technical College will be appointed during June or July. Applications will be received for these positions now. Applicants must have College Degree, and also teaching and practical experience. Address

F. H. SEXTON,
Department of Education,
18 Halifax, N. S.

Agents Wanted

A United States firm manufacturing chemical preparations for water purifying etc. is prepared to appoint represenratives in Toronto and other large Canadian cities. Would like to get in touch with good parties who would be in a position to purchase the chemicals, selling on his own account, or some good responsible party who would handle on commission. Correspondence strictly confidential Write Box 722 CONTRACT RECORD, Toronto. 18

Tenders
for
Asphalt Paving

Sealed proposals addressed to the Chairman, Board of Control, Winnipeg, Man., and endorsed as above, for Grading, Curbing and Construction of Ashalt Pavements, approximately 49,672 square yards, will be received at the office of the undersigned up to 11 A.M. on THURSDAY, MAY 20TH 1909. Plans specifications and forms of tender together with conditions governing tender as prescribed by by law, may be obtained at the office of H. N. Ruttan, City Engineer, 233 James Street, Winnipeg. The lowest or any tender not necessarily accepted.

M. PETERSON,
Secretary.
Board of Control Office, Winnipeg, April 20th, 1909. 18

Tenders Wanted

County of Victoria

Sealed tenders, marked "Tender for Improvements," will be received by the undersigned until TUESDAY, MAY 11TH, 1909, for the installation of a Central Heating System for the buildings in the Court House Square, Lindsay, and for certain improvements in the Registry Office, Lindsay.

Tenders may be for the individual trades or for the whole of the works.

Plans and specifications may be seen at the Court House, Lindsay, and at the office of G. M. Miller & Co., Toronto General Trust Building, Toronto.

Each tender must be accompanied by a marked cheque for five (5) per cent. of the amount of tender as a guarantee that an assured contract will be entered into if tender should be accepted.

The lowest or any tender will not necessarily be accepted.

J. R. McNEILLIE,
County Clerk.
Lindsay, April 23rd, 1909. 18

Tenders

will be received by the undersigned up till 4 o'clock on THURSDAY, the 13TH of MAY, 1909, for all trades required in the erection of a Bank Building at Hanover, Ontario. The lowest or any tender not necessarily accepted. Plans and specifications can be seen at the Merchants Bank, Hanover, or at the offices of Foster & Clark architects, Owen Sound, Ontario.

J. H. ADAMS,
Hanover, Ont. 18

Proposals

The City of Toronto will shortly call for tenders for the laying of underground conduit.

For specifications, apply to the Electrical Department, City Hall. tf

City of Moose Jaw

Saskatchewan

Tenders will be received by the City of Moose Jaw addressed to the undersigned, on MONDAY, MAY 31ST, at 8 o'clock p. m. for the

SINKING OF A TEST WELL

for Gas, Oil, or Water the Contractor to undertake to complete the well before being entitled to any portion of his contract and to provide a schedule showing the allowance he will make on his full contract price if the City call him to stop work at less than the depth agreed upon; the Contractor to provide everything necessary except the well casing now in possession of the City, which he shall take over and allow for at a price to be named in his tender. Tenders are to be accompanied by a deposit of 5 per cent. on the contract price, said deposit to be returned to the Contractor as soon as the plant has been put in operation on the ground.

Alternative tenders are required for a well 2500 feet and 3000 feet respectively, the lowest or any tender not necessarily accepted.

JOHN D. SIMPSON,
City Clerk.
Moose Jaw, April 27th, 1909
20

Town of Estevan

Province of Saskatchewan

Tenders Wanted

Sealed tenders will be received by the Secretary-Treasurer until

Wednesday, May 19th,

for constructing a

Water Works System and Main Sewer

comprising 7,300 feet of Water Mains, 2,400 feet of Tile Sewer, also **Steel Water Tower, Gasoline Engines, and Power Pump.**

Plans and specifications may be seen at the office of the Secretary-Treasurer, Estevan, or of the Chief Engineer, 103 Bay Street, Toronto, on and after April 22nd.

No tender necessarily accepted.

L. A. DUNCAN, Esq.
Secretary-Treasurer,
16-18 Estevan, Sask.

WILLIS CHIPMAN, C. E.
Chief Engineer,
103 Bay St., Toronto, Ont.

Sealed Tenders

Marked "Tenders for Bridge Construction" will be received by the undersigned at Mountain P. O. Ontario, until 12 o'clock noon on SATURDAY, THE 29TH DAY OF MAY, 1909, for the construction of

Two Re-Inforced Concrete Arch Bridges and Two Re-Inforced Concrete Piers

as the case may be, over the Castor River and McCaul Creek on the Boundary Road between Mountain and Osgoode townships, opposite the west half lot 15, con. 12, Mountain, and about eight miles from Mountain Station or Osgoode Station on the C. P. Ry.

The work to be done consists of making the necessary excavation for the construction of the two Bridges above mentioned, grading approaches thereto and the construction of wing fences.

Plans, specifications, etc., may be examined and forms of tender obtained at the following places:

At the Office of the County Clerk, Cornwall, Ont.
" " " " " " Ottawa, Can.
At the residence of John McAvoy, Dawson, Ont.
" " " " Alex. Christie, Mountain, Ont.
or " " office of Magwood & Walker, Civil Engineers, Cornwall, Ont.

The lowest or any tender not necessarily accepted.

(Sgd) ALEX. CHRISTIE,
"Commissioner."
Mountain, Ont, April 22nd, 1909. 20

Positions Wanted or Vacant

ARCHITECTS' AND SURVEYORS' ASSISTANT desires engagement; 5 years' experience; good draughtsman. Write box 737, CONTRACT RECORD, Toronto 18

BRICK SETTER AND WHEELERS WANTED; we make 40 thousand brick a day; rack and pallett yard; will let setting and wheeling by contract or day work. ALSIP BRICK AND TILE CO., 203 Leith Street, Fort William, Ont. 18

ENGINEER with long and valuable experience in construction and supervision of Hydro Electrical Plants is open to engagement May 1st. Experience especially valuable to Mining Company or with Company doing a commercial business with mines. Box 735, CONTRACT RECORD, Toronto. 19

ELECTRICAL ENGINEER with 10 years' experience in all branches of the business is open to engagement May 1st with Light, Power or Traction Company as Superintendent. Capable of making complete installations and excellent references as to character and business ability. Box 734, CONTRACT RECORD, Toronto. 19

WANTED—Position as Manager or Superintendent of a small Hydro-Electric Plant; 15 years' experience. Familiar with motors, generators, line construction, inside wiring, telephones and high tension practice. Single, reliable, temperate and a hustler. Holding good position now and have done so for four years but environment not satisfactory. Apply Box 739, CONTRACT RECORD, Toronto. 19

Miscellaneous

ELECTRIC SIGNS.—A firm manufacturing up-to-date signs are open to appoint selling agents. Would like to get in touch with aggressive and reliable firms or individuals who would push this line either all over Canada or in sections to be arranged Correspondence confidential. Box 724, CONTRACT RECORD, Toronto. 18

Business Opportunities

BRICK YARD OUTFIT—A Rack Yard of seventy-five thousand brick one boiler; also 25 horsepower engine, with iron stack, of about 50 feet; one Martin machine and turn table; also 3 trucks, 3 wheeling-out barrows, Walker & Son make; 6 other barrows, cart, etc.; all in good condition; for sale cheap for cash. W. BLANCHARD, Penetanguishene, Ont. 18

Tenders

Sealed tenders will be received by the Secretary-Treasurer of the Town of Yorkton until MONDAY, the 24TH DAY of MAY, 1909, for the construction of

SEWERS

as follows:

2000 feet of 12 inch, and 15000 feet of 8 inch, with all necessary appurtenances, all in accordance with plans and specifications which may be seen at the offices of the Town Engineer.

R. H. LOCK, F. T. McARTHUR,
Secretary-Treasurer, Town Engineer,
Yorkton, Sask. Yorkton, Sask.

19

Department of Militia and Defence

Notice To Contractors

Royal Military College, Kingston

New Water Supply

Sealed Tenders, marked on the envelope "Tender for Water Supply, Royal Military College, Kingston," and addressed to the Secretary of the Militia Council, Department of Militia and Defence, Ottawa, will be received until noon, MAY 15, 1909, for the installation of a new Water Supply, at the Royal Military College, Kingston.

Plans and Specifications may be seen and full information obtained at the Offices of the Commandant of the Royal Military College, Kingston, and the Director of Engineer Services, Militia Headquarters, Ottawa.

Tenders must be submitted on printed forms supplied by the Department of Militia and Defence, and each tender accompanied by an accepted cheque on a Canadian Chartered Bank for 10 per cent. of the amount thereof, payable to the order of the Minister of Militia and Defence, which amount will be forfeited if the party tendering declines to enter into a contract in accordance with the tender.

The Department does not bind itself to accept the lowest or any tender.

EUG. FISET,
Colonel.

Deputy Minister of Militia and Defence, (H. Q. 74—20—4.)
Ottawa, April 22, 1909.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department.

19

City of Fernie

(Province of British Columbia)

Tenders for

Electric Light and Power System

Sealed tenders addressed to the undersigned will be received at the City Clerk's Office up to 5 p. m.,

May 13th, 1909

for the construction of an Electric Lighting system and the equipment in connection therewith.

Copies of plans and specifications may be obtained at the City Engineer's office.

Each tender must be accompanied by a certified cheque for 5 per cent. of amount of bid, payable to the order of the City of Fernie.

Individual tenders will be received for
(a) Electric Lighting Distribution System.
(b) Erection of Power House and Foundation.
(c) Removal of Power Plant from Coal Creek and erected in station at Fernie, and installing Boilers.
(d) Supplying 3 Horizontal Return Tubular Boilers, 150 H.P. guaranteed B.C. Inspection at 125 lbs., with Stack and Blower complete, one Feed Water Pump, one Injector, one Feed Water Heater.

Tenders may be made for one or more of the above items.

The lowest or any tender not necessarily accepted.

R. POTTER,
City Engineer.
G. H. BOULTON,
City Clerk.

18

Tenders For

Concrete Bridge Construction

Tenders will be received at the office of the undersigned up to twelve o'clock, noon, of MONDAY, MAY 10TH, 1909, for the construction of a Reinforced Concrete Arch over the Humber River on a deviation of the townline between the Townships of King and Vaughan; also for Two Concrete Abutments for a bridge over Highland Creek, Concession 1, Lot 14, in the Township of Scarboro'.

Plans and specifications may be seen and all necessary information may be obtained at the office of the undersigned, 57 Adelaide Street East, Toronto.

The lowest or any tender not necessarily accepted.

FRANK BARBER, C. E.,
Engineer for the Municipalities.
Toronto, April 27th, 1909.

18

Town Of Sault Ste. Marie, Ont.

Notice To Contractors

Sealed Tenders addressed to T. E. Simpson, Mayor, will be received up till 12 o'clock noon on MONDAY, MAY 17TH, 1909, for the construction of about 90,000 superficial feet of

Cement Concrete Sidewalk

Specifications and form of Tender may be seen at the office of the Town Engineer, Town Hall, Sault Ste. Marie, Ont, on or after May 5th, 1909. A deposit of five per cent. of contract price must accompany each tender. The lowest or any tender not necessarily accepted.

T. E. SIMPSON, W. F. GRANT, C. E.
Mayor Town Engineer

18

Business Buildings and Industrial Plants

(Continued from page 21)

Vancouver, B.C.

Chas. Tellean will build a $25,000 hotel on Vancouver Island at Campbell river.

Winnipeg, Man.

Chaffey & Verhoeven hav been granted a permit for a three storey office building on Garry street. Estimated cost, $7,000.

Yorkton, Sask.

The Casson block is to be extensively remodelled.

AWARDED.

Calgary, Alta.

The Trussed Concrete Steel Company, Toronto, have been awarded the contract for the steel in the reinforced concrete construction of the Hull office building. This structure will be 130 x 50 and six storeys high. Hodgson & Bates, architects, this city.

Edmonton, Alta.

Barnes & Gibbs, architects, this city, have awarded the following contracts for a store building to be erected for Mr. I. R. V. Carpenter: General contract, McSpoiran & Company; plumbing, Standard Plumbing Company. The building will be two storeys in height, 40 by 30 feet, of frame construction, and will cost $5,000.

Kingston, Ont.

The Trussed Concrete Steel Company have been awarded the contract for the steel in the reinforced concrete construction of the Davis Tannery Building. This building will be 60 x 210 feet, three storeys high, and will be the first all reinforced concrete tannery building in Canada. O. E. Tench, Newmarket, architect.

Montreal, Que.

Marchand & Haskell, architects, 164 St. James street, have awarded the general contract for the erection of the new premises for the National Bank, corner of Place d'Armes Hill and St. James street, to J. B. Pauze & Company, general contractors, 70 St. James St. Cost, $126,498.

The general contract for the erection of a six storey store for H. A. Wilder & Company, corner of Ontario and Bleury streets, has been awarded to C. E. Deakin, general contractor, 11 St. Sacrement street.

The contract for the alterations to property, corner of St. Francois Xavier and Notre Dame streets, for Mr. Rudolphe Forget, has been awarded to Joseph Binette, contractor. J. E. Huot, 260 St. James street, architect.

Architects Ross & Macfarlane, 1 Belmont street, have awarded the following contracts for the erection of a bank building at the corner of Prince Arthur street and St. Lawrence Boulevard, for the Dominion Bank: Masonry and brickwork, Jas. Morrison; carpentry, D. M. Long.

The Terrano Flooring Company, Liimted, have been awarded the following contracts: Bathrooms for Geo. Sleep, contractor; residence, Thomas P. Kenneth, Westmount; restaurant, A. B. Dufresne; A. E. Ogilvie's residence, Cartierville; Mr. Howard's residence, Geo. T. Hyde, architect; Mr. R. Archer's residence, Ross & McFarlane, architects.

Eadie-Douglas Company, 40 Hospital street, closed the following contracts for Bermatoff's Terra Cotta: Jacob's Building, Montreal, Mitchell & Crighton, architects; Bank of Comerce, Lethbridge, Alta., and Charlottetown, P.E.I., Darling & Pearson, architects, Toronto.

The contract for the additions to Molson's Brewery, Notre Dame street west, has been awarded to J. H. Hutchison.

The contract for the alterations and additions to the National Bank has been awarded to J. B. Pauze & Company, at $126,498. The other tenderers were: C. E. Deakin, $127,900; John Stewart & Company, $135,500; Simoneau & Dion, $135,600; O. Martineau & Son, $147,000; Labelle & Lessard, $151,500.

St. Catharines, Ont.

John Davis has been awarded the contract for an addition to the Whitman & Barnes' factory.

St. Johns, Nfld.

Peden & McLaren, architects, Montreal, Que., have awarded the contract for the installation of bank fittings in the new bank building for the Bank of Montreal, St. Johns, Newfoundland, to the Canada Office & School Fitting Company.

Victoria, B.C.

The contract for the erection of the new business block to be erected on Government street by Lim Dat has been awarded to Luny Bros. Estimated cost $35,000. Hooper & Watkins, architects.

Power Plants, Electricity and Telephones

Brandon, Man.

The Muncipal Light, Heat & Power Company has been incorporated with a capital of $50,000. The incorporators are: G. Edgar Knechtel and Violet Knechtel, both of Winnipeg, Man.; M. B. Jackson and W. A.

Thompson, Hamiota, Man., and W. C. Fraser, of Hamiota.

Montreal, Que.

Tenders addressed to Charles Brandeis, consulting engineer, Montreal, will be received until May 12th for the supply of 1,000 horse power steam turbine generator sets, for the Saraguay Electric & Water Company of Montreal.

Rosewood, Man.

The Rosewood Rural Telephone Company has been organized here with the following officers; T. F. Morris, president; Wiliam Norman, vice-president; Charles Claydon, treasurer; W. C. Morris, secretary; G. Claydon, manager.

Stratford, Ont.

Mr. N. M. Cantin, St. Joseph, has submitted a proposition to the City Council on behalf of New York capitalists to build an electric railway between St. Joseph and Stratford, a distance of about 65 miles, upon the condition that the city guarantee the bonds of the concern up to $250,000.

Saltcoats, Sask.

Plans are being made by the Saltcoats District Telephone Company to erect about 50 miles of telephone line this season.

Toronto, Ont.

The municipalities forming the Niagara Power Union have decided to combine for the purchase of supplies for their distribution plants, and appointed a committee composed of Controller Hocken, Toronto; Dr. F. Guest, St. Thomas; Ald. D. A. Stewart, London; Mayor W. J. Dingman, Stratford; and Mr. Sam Carter, Guelph, together with the officers of the union, to secure from the various municipalities information as to the nature and quantities of supplies required, and also from contractors the terms upon which they could be obtained.

The City Electrician invites tenders for conduits throughout the city. (See advertisement.)

Wilmer, Sask.

The Wilmer Rural Telephone Company has been organized with the following named officers; T. M. Leggat, president; Sanford McNeil, vice-president, and Thos. Larkin, secretary and treasurer.

Winnipeg, Man.

It is reported that the Great Falls Power Company is planning to develop the water power of the Winnipeg river and erect a power plant with an output of 180,000 h.p. The canal, it is said, will cost $1,000,000. H. M. Byllesby, of Chicago, Ill., is reported interested in the enterprise.

Windsor, Ont.

According to estimates it will cost the city from $125,000 to $130,000 to build a distributing station and transmission lines for Niagara power. The price for electricity from the Hydro-Electric Power Commission in amounts less than 5,000 h.p. delivered at Windsor is $38 per h.p. per year, which, with the cost of the distributing system, would make the cost about $45 per h.p. per year.

Miscellaneous

Barrie, Ont.

The ratepayers will vote May 17th on a by-law to issue $40,000 4½ per cent. 20 years loan debentures. E. Donnell, Town Clerk.

Moose Jaw, Sask.

Contracts are called by the city of Moose Jaw for the sinking of test well for gas, oil or water. (See advertisement.)

Montreal, Que.

Recent building permits include: James Robinson, McGill street, alterations to property at 196 St. Catherine street west, $5,000; H. Chagnon & Company, 605 Davidson street, alterations to property at 23 Burnett street, cost $3,000; James Robinson, McGill street, alterations to property at 271 Bleury street, cost $5,500; Jos. Charlebois, 290 Rivard street, house containing two dwellings on St. Denis stret, cost $3,300; Dr. Fred. Demers, St. Lawrence Boulevard, store on Mount Royal avenue, $2,000; Jos. Rozon, 55 Fulford stret, two houses containing six dwellings on St. Remi street, $4,500; D. Blay, 89 Poplar avenue, two houses containing six dwellings on St. Remi street, $4,500; Madame J. Drouin, 84 Cutillier street, house containing three dwellings on Valois street, $2,400; James Crathern, 32 McGregor street, three storey residence on McGregor street, $12,000; W. Charbonneau, 1104 St. Lawrence Boulevard, six houses containing eighteen dwellings on Bagg street, $11,700; M. Bellerose, 1918 Labelle street, two houses containing six dwelling on Labelle street, $4,000; M. Debrofsky, 241 St. Lawrence Boulevard, house containing three dwellings and four stores on Sanguinet street, $3,500; Meldrum Bros., 32 Wellington street, two storey warehouse on Wellington street, $4,780; Aime Handfield, 806 Papineau avenue, two houses containing three dwellings and one store, corner of Mt. Royal and Marquette streets, $13,000; J. B. Pelletier, 35 Lalonde avenue, house containing three dwellings on Dufresne street, $3,000; St. Michael's Parish, 1602 St. Denis stret, church on St. Denis street, cost $9,500; Lemire & Lachapelle, 2585 St. Hubert street, house containing four dwellings on St. Zotique street, cost $1,500; and two houses containing eight dwellings and one store on Labelel street, cost $3,000; Geo. Demetelin, 557 St. James street, alterations to property at 147a St. Catherine street east, $2,000; L. A. Robillard, 243 Pie IX street, alterations to property on Cuvillier street, $2,000; F. Morency Fils, 228 Visitation street, house containing two dwellings on Fabre street, $3,000; Dominion Oilcloth Company, 1192 St. Catherine street east, factory on Parthenais street, $40,000; E. Valiquette, 539 Alma street, house containing three dwellings on Cowan street, $1,900; Euclide Denault, 280 Breboeuf street, house containing four dwellings on Breboeuf street, cost $3,500; J. A. Durocher, 12 Alywin street, house containing three dwellings on Alywin street, cost $2,500; J. O. Gagnon, 1849 Notre Dame street west, two houses containing six dwellings on Alywin street, cost $4,000; S. D. Vallieres, 1431 St. Hubert street, five houses containing fifteen dwellings on Mackay street, cost $13,000; S. D. Vallieres, 1431 St. Hubert street, house containing three dwellings on Argyle avenue, cost $3,000; C. A. Spriggings, 5a Shuter street, two houses containing six dwellings on Mitcheson street, $13,000; Frs. Harel, St. Catherine and Dufresne street, three houses containing ten dwellings, $32,000; N. Beaupre, 20 Laporte avenue, house containing three dwellings on Convent street, cost $8,000; Alf. Deguire, 1372 Delorimier avenue, two houses containing six dwellings on Fabre street, cost $4,000; Louis St. Germain, 2050 Notre Dame street west, house containing three dwellings on St. Marguerite and Notre Dame streets, $6,000; Jos. Groulx, 54 College street, house containing six dwellings on Convent street, cost $6,000.

Owen Sound, Ont.

The ratepayers will vote May 15 on by-laws for the following: $30,000 20 years 4½ per cent. for the improvement of the electric light plant, and $7,000 4½ per cent. 15 years debentures for the improvement of town hall and market, $125,000 4½ per cent. 25 years waterworks debentures, $3,500 4½ per cent. 10 years hospital debentures. Chas. Gordon, Town Clerk.

Toronto, Ont.

Recent building permits include: T. Eaton Company, 12 storey and basement brick factory, Trinity square, $215,000; A. Armstrong, 2 storey brick store and public hall, Pape avenue, $6,000; H. Rosenthal, pair semi-detached 2 storey brick stores and dwellings, Dundas street, $6,000; Henry Gaffney, six pairs semi-detached two and a half storey brick dwellings, Symington avenue, $28,000; E. G. Switzer, two pairs semi-detached two storey and attic brick dwellings, Pearson avenue, $10,000; W. H. Avison, two storey and attic brick dwelling, Parkway avenue, $2,500; J. Lancaster, four detached two and a half storey brick dwellings, Constance, $8,000; Pullan & Sons, alterations to factory, corner Bay and Wellington streets, $3,000; A. Russell, two and a half storey brick dwelling, Deleware avenue, $2,500; Harton Walker, two storey and attic brick dwelling, Edgar avenue, $8,000; C. W. Chadwick, two storey and attic brick dwelling, Springhurst avenue, $3,200; R. J. Hoidge, two and a half storey brick dwelling, Major street, $3,500; W. R. Miller, pair semi-detached two and a half storey brick dwellings, Withrow avenue, $4,000; W. J. Faulkner, two storey brick dwelling, Geoffrey street, $3,000; George Rathbone, two and a half storey brick dwelling, Laxton avenue, $9,000; St. James' Parish, three storey and basement brick school, corner Church and Adelaide streets, $65,000; Arnold Sample, two storey brick dwelling, College street, $4,500; G. Nicholson, five pairs semi-detached two storey roughcast dwellings, brick fronts, Galt avenue, $12,000; C. M. Essery, two pairs semi-detached two storey brick dwellings, Wickson avenue, $10,000; J. B. Henderson, pair semi-detached two storey and attic brick dwellings, Brock avenue, $5,400; City of Toronto, one storey brick and concrete steel transportation building, Exhibition grounds, $87,000; Thomas J. Mulvihill, pair semi-detached two storey brick stores and dwellings, Bloor street west, $4,000; E. R. Reynolds, two and a half storey brick dwelling, Dundonald street, $5,600 H. L. Stephens, one storey brick mission, Queen street, $8,000; A. E. Armstrong, two and a half storey brick dwelling, Farnham, $2,600; W. W. Hiltz, two pairs semi-detached two storey brick dwellings, Sparkhall, $8,000; A. B. Brown, three detached two storey and attic brick dwellings, De Lisle street, $11,000; R. Mackey, three pairs semi-detached two storey brick dwellings, Wright avenue, $12,000; Robert Doherty, two and a half storey brick dwelling, Foxbar, $4,500; Walter Hudson, one pair semi-detached two storey and attic brick dwellings, Hamburg street, $5,000; E. C. Tuckett Estate, four two storey brick dwellings, Sinclair, $8,000; Thomas Harris, pair semi-detached two storey brick dwellings, Neepawa, $5,000; Rosedale Presbyterian Church, two storey brick and stone church, corner South Drive and Huntley street, $30,000; Chas. Cooper, two storey brick dwelling, Dupont street, $3,600; A. H. Smith, two and a half storey brick dwelling, Indian road, $4,500; Stanley & Coath, one pair semi-detached two storey and attic brick dwellings, West Marion street, $5,000; John Squire, pair semi-detached two and a half storey brick dwellings, Russett avenue, $5,000; J. M. Walker, two pairs semi-detached two storey brick dwellings, Sunnyside avenue, $8,000.

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A Plea for the Better Recognition of Skilled Mechanics

"Do employers value an employee who has educated himself in such a way that he is possessed of a better knowledge of work, science and life in general than the majority of those employed in his line of work?" This question was recently propounded in the New York "Times" by a correspondent, employed in a branch of the building industry, who was rightly impressed with the idea that artistic feeling and ability should be recognized qualifications in a mechanic. The importance of the question will be admitted by all who have the welfare of the trade at heart. It calls attention to an undesirable condition in the building field in this country. From the point of view of the progressive artisan the almost universal tendency to value a man's work by the quantity, rather than by the quality, is discouraging. From an unbiassed standpoint it will be seen that such a condition will do little to elevate the status of the workman.

An analysis of the question leaves it open to doubt whether this matter is the fault of the employer or of the employee. The "Times" correspondent blames the former. He says: "To-day, in my branch, the men who are employed are those who are intensely practical, those who can put up such quantities of work that the artistic side, as a matter of course, is almost neglected." Now, is there not a modicum of truth in this? If they are carrying out a contract of any importance are not Canadian builders making a mistake in discounting the claims of the good workman, who does a small amount of work and does it well, and in placing a premium upon the man who can "get through," in some fashion, a great quantity of work? Is there not a certain amount of folly in lending our quota to establishing one class of workmen, good and bad?

The employer, when taken to task for inferior work generally maintains that there is a lack of skilled artisans and that his workmen are the best available. Cannot the employers do something to stimulate a demand for better workmen? It is certain that without some stimulation of this kind there will be little improvement in the quality of labor in the Canadian building industry. If a careful investigation be made it will be found that in the execution of some of our best lesigns portions of the work are frequently marred by inferior workmanship and misinterpretation of ornament that destroys both line and texture.

In comparison with the numbers engaged in the various branches of building in this country, there are comparatively few mechanics who can be said to be really competent. Such a condition is disadvantageous both to the trade and to the country. Canada, while still young, is no longer in her infancy, and we who have a national pride in the development and up-building of her youth should appreciate and fulfil the duties connected with our particular work. The architectural profession in this country has made rapid strides in recent years, but of what avail is this if our workmen are not capable of doing justice to the conceptions of our architects.

The practical absence of the skilled artisan is a matter which should receive the attention of every Canadian builder. He owes it not only to himself, but to the trade and to the country, to contribute something to the creation of such a demand for skilled workmen, that the quality of the work put into the countless numbers of important structures that will be erected between now and the day when Canada will have attained her majority, will be a credit to the builders and workmen of our time.

Exemplification of an Old Adage

The sensitiveness of modern markets is something to wonder at. Business men scheme and plot without avail, for months at a time, to bring about a fractional advance in the price of some commodity, and then an unexpected influence comes into play and does for them in a day what they have given up hope of bringing about at all. Shingle producers in Canada have wanted higher prices for a long time but could not obtain them, as the market would not pay the price. A short time ago, a heavy wind storm passed over most of Canada and in many places obtained the proportions of a hurricane. In its wake were left many farm houses, barns and city buildings without roofs, and now the price of shingles has been advanced 10 cents a thousand. It is an ill wind that blows nobody any good.

Permits for twenty-two factories, costing $234,000, were issued in Toronto last year.

May 5, 1909

Prosperity and Development of the West

Vancouver and Victoria Correspondence Indicates Lively Conditions in Coast Cities.

Victoria, B.C., April 29.—There is every indication of Victoria having passed the depression period which affected the whole continent, and she is now about to enter on her most prosperous times. Before the season has far advanced there promises to be a large number of buildings under way in the business section of the city. A number of substantial up-to-date blocks are planned.

Pemberton & Son will build a modern block on the corner of Fort and Broad street, to replace the one destroyed by fire. On the opposite corner the new home of "The Times" newspaper will be built this spring. In this building there will be not only accommodation for the paper, but for a large number of offices.

On Government street, in the heart of the business section, the Royal Bank will erect a substantial headquarters on the site of the building now occupied by Fred Foster and W. Bowman.

On Yates street, above Sylvester's store, a block of stores, with rooming accommodation above, is being built by a local syndicate.

Watson & McGregor, on Johnson street, will replace their present premises with a substantial brick block, to meet the demands of the trade.

On Yates street, opposite the premises now occupied by Stephen Whyte, Cameron & Caldwell will erect a modern livery and boarding stables.

B. Wilson & Company, cold storage, and Wilson & Company, wholesale grocers, have blocks well advanced on Head street. In this section of the city Lim Dat is contemplating a brick block three or four storeys high.

G. Forbes Vernon is contemplating the erection of a building on a vacant lot on View street, next to the Vernon block.

The B. C. Land & Investment Company are arranging for the erection of a big block on the corner of Langley and Broughton streets. It will be a three-storey building fitted up on the ground floor with stores and offices, and offices above. The site occupied is about 60 feet by 70 feet.

The aggregate value of buildings for which permits were issued by the Building Inspector in Victoria during the month of March was $121,640, just $20 more than the previous month. The total number of permits issued was 58, compared with 48 in February. These figures do not include the buildings being erected in Oak Bay, Esquimault and other districts adjoining Victoria. In all these sections there has been a great deal of building done, and while the figures do not show in the returns, they are practical evidence of the city's growth.

Building permits for structures aggregating in value $24,950 were issued in one day in Victoria; of that amount $18,000 will be spent in the erection of a business block, to be built by three Chinamen, on the northwest corner of Broad and Yates streets. The other items were for dwellings.

The monthly building figures this year compared with the corresponding months a year ago are as follows:

	1909	1908
January	$ 78,080	$ 54,725
February	121,620	73,315
March	121,640	110,800

Vancouver, April 29.—The building returns and bank clearings are making new records in Vancouver. The demand for buildings chiefly relates to the provision of homes to live in and places of business, from one end of the town to the other. The construction of steel offices and buildings, marks a new era in the down-town development of the city. The best principles adopted in the building of modern blocks, both on the Pacific coast and in the East, are being applied to-day in Vancouver.

The comparative freedom from the courts of realty and building disputes, in view of the large business deals completed, speaks volumes for the businesslike methods employed in handling such affairs. In British Columbia the title registering system is very simple compared with the cumbersome methods in existence on the Puget Sound. Many sub-divisions of property are taking place, and a considerable proportion of the cheap lands that are held are being built upon, so that the thousands of outsiders constantly coming in, will have a wide range to choose from when locating their homes. Practically speaking, the city now extends from Burrard Inlet to the Fraser river, and Port Moody to the sea, and at almost every regular council meeting there are applications from outlying municipalities to be taken into the city proper.

In 1907 it was claimed that Vancouver would have 100,000 population before the end of 1910. The statement is now made in the local press that, thus early in 1909, the population has already reached that mark. During the next few years it is expected that thousands of suburban homes will be built on the splendid view points overlooking the Fraser river and Gulf of Georgia to the south, and Burrard Inlet and Vancouver to the north.

A new record was created for one day's business in Building Inspector Jarratt's office, when between the hours of opening and closing 28 permits were issued. Among these were permits for a magnificent dwelling to be erected by R. P. McLennan, ex-Mayor of Dawson, Trafalgar road, to cost $25,000. Three other permits were granted, to W. Francey for an $8,500 block on Powell street, to J. Shanahan for a $10,000 block on Park Drive, and to Campion & Pound for an $8,000 block on Westminster avenue. The permits aggregated in value $60,000.

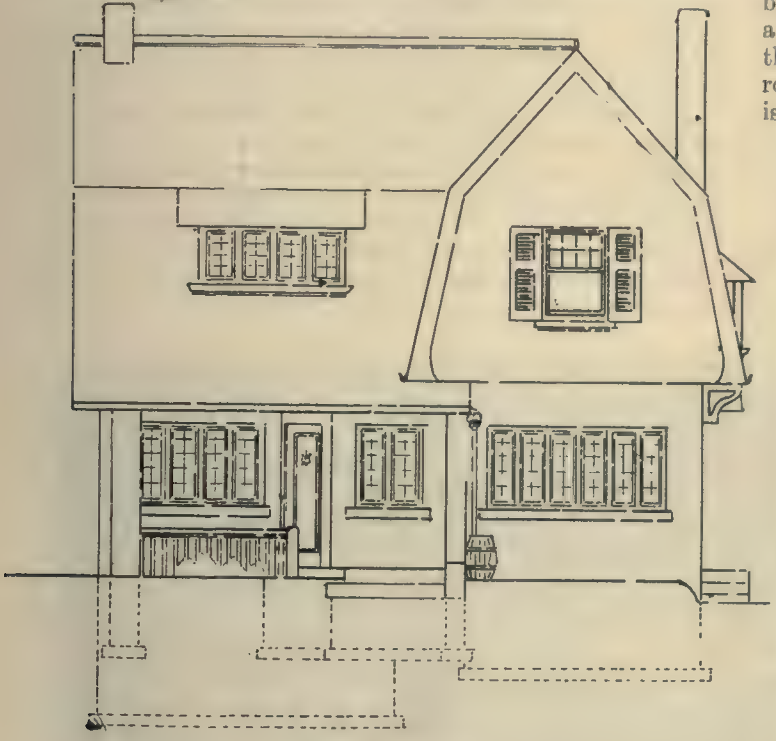
The following statement of building operations may be of interest:

Total number permits, March, 1908	192
Total value of buildings, March, 1908	$ 485,555
Total number permits, March, 1909	229
Total value of buildings, March, 1909	$ 798.750
Total number permits, 3 months, 1908	476
Total value of buildings, 3 months, 1908	$1.209.465
Total number permits, 3 months, 1909	526
Total value of buildings, 3 months, 1909	$1,574.035

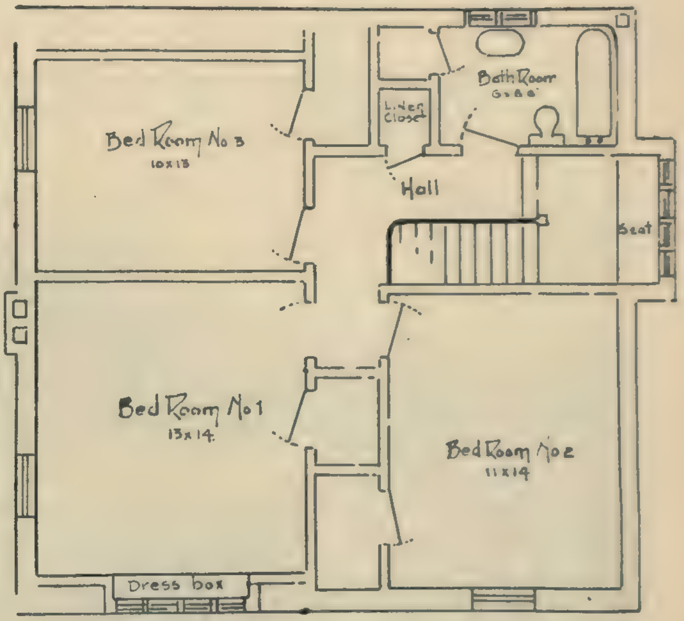
The largest wharves in the West are to be built in Vancouver by London capitalists, who have completed a deal whereby they have secured 800 feet of water frontage in Hastings townsite for $100,000. The area of the property is about five acres, and consists of 26 lots lying on the waterfront between Windermere and Nootka streets.

An Attractive Cottage at Low Cost

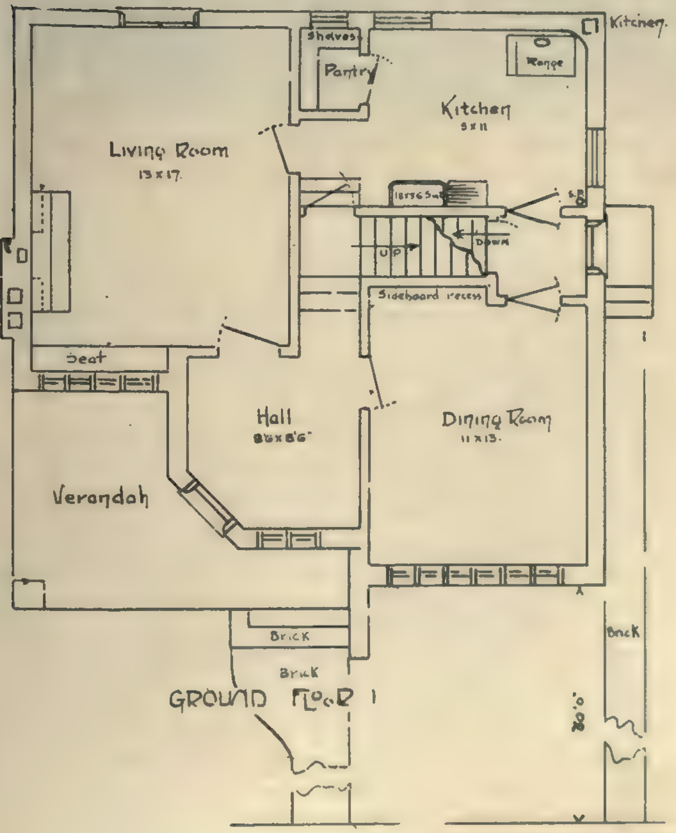
The designs of the cottage published herewith are a good illustration of what may be accomplished in the way of artistic effect at a moderate expenditure. This cottage is to be erected at Sheldrake avenue, Eglinton, and was designed by Mr. Forsey Page, architect, 1226 Traders' Bank Building, Toronto. The first storey is to be constructed in buff brick with sepia joints. An additional air of brightness is given to the exterior by the use of green shingles for the roof and gable ends. All of the exterior painting will be done in cream with sepia trimmings. The exterior of the house will reflect simplicity, comfort and economy of space. A study of the floor plans may be profitable to the intending builder. The living room is to be finished with a panel beam ceiling and a window seat. A long, low brick fireplace has been designed for this room. The dining room will have a recessed buffett. Stained pine trim is being used throughout the ground floor with a ⅜ oak floor in dining room, living room and main hall. The estimated cost is $3,000.



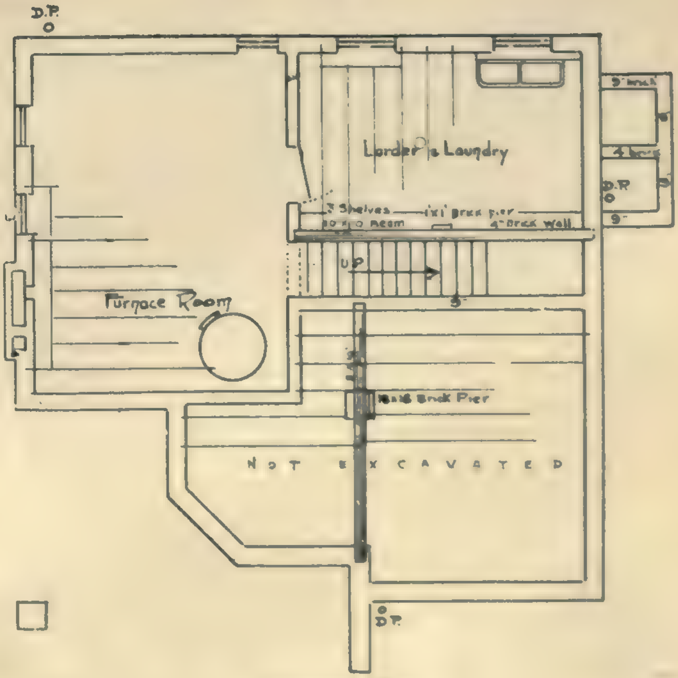
Front Elevation.



Upper Floor Plan.



Ground Floor Plan.



Basement Plan.

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

A Reinforced Concrete Arch at Mapleton, Ont.

The Mapleton Bridge, at Mapleton, in the Township of Yarmouth, Ont., illustrated herewith, was designed by Mr. James A. Bell, C.E., City Engineer of St. Thomas, to carry a live load of 150 pounds per square foot of floor, or a concentrated wheel load of 15 tons on two axles, 10 feet centres.

This bridge is a 40-foot reinforced concrete beam structure with a solid panel railing, showing four reinforced beams in cross section, these beams having a 1¾-inch camber.

The concrete for abutments was in the proportion of 1 : 8, and stones and boulders were used in the construction. The abutments consist of a face wall, 16 inches thick at bottom and battering to a 12-inch wall at top, and buttress walls 12 inches thick, the reinforcing for both main and buttress walls being ½-inch plain bars spaced 12 inches horizontally and vertically.

40 ft. Beam Span at Mapleton, Ont.

For the reinforced beams and floor, the concreting mixture was 1 : 2½ : 4, the aggregate being broken stone. The Kahn system of reinforcing was used in the beams, and expanded metal in the floor—using No. 10 gauge, 3-inch mesh.

The two centre beams were reinforced with five bars, three being 2-inch x 3½-inch x 43 feet long, and two bars 1-inch x 3-inch x 30 feet long, while the reinforcing for outside beams consisted of three bars, two being 2-inch x 3½-inch x 43 feet long, and the other 1-inch x 3-inch x 30 feet long.

This formula is said to be a good one for filling cracks in the floor. Make a pulp of paper, tissue paper being the best, though any paper will do, and add to it glue size and calcined magnesia until you have a mass like putty Press this into the cracks with a putty knife, make the surface smooth and level with the floor. The filler may be colored as desired.

Suggestions for Town Planning

The improvement of the appearance of cities and towns is attracting attention everywhere in this country; few towns are too small to be without their local improvement society, while the large cities have all sorts of clubs for all sorts of betterment. Ten years ago attention was mainly directed by these associations toward the construction of parks, but experience has shown that parks can sometimes be well dispensed with, and the money they cost be utilized in other directions with more satisfactory results. Most of the British provincial cities also have similar societies striving to make the living conditions of all classes somewhat more attractive. The movement in this direction has even gone so far as an agitation to secure the passage of a parliamentary act dealing with town planning, and it is understood there is some probability of such legislation being eventually obtained. The Institute of British Architects has taken an active part in advocating this bill, and some general expressions of opinion on the subject were brought out at a recent meeting held to discuss a paper on some aspects of town planning.

The paper itself was unusual in character. It gave the author's conception of an ideal city. In the narrow streets of the business centres, no vehicles whatever were permitted between 8 a.m. and 8 p.m., while in the wider streets of these sections only light cabs were allowed, the large waggons being permitted only on a few main arteries and then only when engaged in public service. No ordinary trucking except in waggons able to cover ten miles an hour was permitted in these parts of the city. The warehouses were all in one section of the city and connected with the railway terminals by freight subways. The retail business portion of the city was bordered on the outside by a main road, so that trucking proceeded outward to this road and then around instead of across the city. The leading hotels, stores and theatres face on this road. The municipal buildings

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and the university were built on squares in its vicinity, and a small stream not far from it was canalized and changed into a water park. These brief notes concerning the paper give some idea of its character. It was a purely ideal picture, and those taking part in the discussion of it treated it as such. As one of the members stated, valuable as were the results to be obtained by students from such schemes, it was important for professional men not to frighten the public by putting before it too many big schemes which were not in harmony with the development of the actual life of the town. This criticism, it will be observed, was exactly in line with that made by a number of competent critics of plans proposed during recent years for the embellishment of some of our leading cities. As one speaker at the institute discussions well said, those in charge of such work ought to take a very fast grip on the life of the town which was developing, and for which they had to find an expression in their town improvement schemes, and work outward from it a little bit more than working backward from schemes in the air. A scheme to be successful should always have features that will commend it to financial men, otherwise its adoption is improbable.

The discussion before the institute brought out more satisfactory results than mere criticisms of an impracticable ideal. For example, Mr. W. H. Lever, M.P., who has built one of the most interesting model towns in Great Britain, emphasized the trouble due to lack of proper street plans when a city begins to develop. The plans satisfactory for a small town are likely to prove defective when the place grows into a city. Important streets are then occupied by car tracks, with the consequence that their width is insufficient for all the travel they must carry. Often the arrangement of streets in the suburbs does not permit people to pass readily from the business districts to all parts of the outlying sections, and consequently there is no uniform centrifugal development and the stagnation in some sections tends to concentrate the least desirable class of dwellings there. It was his opinion, based on observations extending over a long period and in many countries, that the plans for streets in outlying sections ought to be developed at least ten years before the construction of buildings begins in order that careful study might be paid to every consideration likely to have any effect on the development of the locality.

This matter of street planning is closely associated with that of preventing congestion in various parts of the city. The latter received some attention in the discussion and several of those taking part pointed out a method of relieving such a condition which had not been suggested in this country. A street plan was a design, and, like all other designs, it must have a scale; some parts must be emphasized and others subordinated. A consideration of this fact will show that by developing supplementary centres, where minor public buildings or business premises would naturally be placed, an opportunity is afforded for materially improving the appearance of different sections of the city. For example, schools and fire engine houses might be made sub-centres in the street planning, while small squares or parks, railroad stations and the like afford other opportunities of the same nature. Advantage can be taken of all these things while the street plan is being developed. Such business-like and useful suggestions are particularly gratifying after the impracticable and extraordinarily expensive projects advanced by architects for street planning and municipal betterments in some of our cities.—Engineering Record.

Mr. Arthur Ireland, Calgary representative of the Winnipeg Paint & Glass Company, died recently.

Reducing Water Hammer

Water hammer in some of the large mains of the Detroit water works has been materially reduced by the use of an air chamber, according to the annual report of Mr. George H. Fenkell, civil engineer of the water board The direct pumping system is used. About half a mile from the pumping station an emergency station has been built and equipped with a 1,000 cubic feet air chamber, an electric motor and air compressor, and other apparatus. This chamber is conected to two 42-inch force mains, and since it was installed the pressuge gauges on a 24-inch connecting main a few miles distant have shown a reduction in the ordinary water hammer from about 12 pounds to 3 pounds, while the hammer on one of the 42-inch mains with which the chamber is directly connected has been reduced from 10 pounds to 4 pounds.

Water Rates at Victoria, B. C.

A new by-law has been adopted by the Victoria, B.C., city council fixing water rates. For dwellings the rate grades from 85 cents per month for four rooms to $2.25 per month for fourteen rooms. The meter rates are as follows: Within the city limits—For the first 2,000 gallons, or part of 2,000 gallons, $1; residences, for all water over 2,000 gallons, for every 1,000 gallons, 12½ cents; all other, for all water over 2,000 gallons, but not exceeding 75,000 gallons per month, 22½ cents per 1,000 gallons; for all water over 2,000 gallons, where the consumption per month is from 75,000 to 100,000 gallons, 20 cents per 1,000 gallons; for all water over 2,000 gallons, where the consumption per month is over 100,000 gallons, 17½ cents per 1,000 gallons; all meters to be read monthly. Meter rents: ⅝-inch per month, 25 cents; ¾-inch per month, 25 cents; 1-inch per month, 50 cents; 1½-inch per month, 75 cents; 2-inch per month, $1; 3-inch per month, $1.50; 4-inch per month, $2. There shall be no meter rent on private residences.

Decision in Favor of a Cesspool

The cesspool has been so long regarded as under the ban of sanitary science for every use, says the "Engineering Record," that it is worth while noting a decision in its favor made some time ago by the Massachusetts Board of Health. It was proposed to discharge the sewage of a country estate into a 3,800 gallon septic tank and then filter its effluent on two beds having a total area of about 200 square feet. The board condemned this plan and reported that it would be less expensive and more satisfactory to discharge the sewage into a cesspool in the gravelly soil of the vicinity, or deliver it from a tank through subsurface drains if a proper tract of coarse sand or gravel was available, as the appearance of the surface indicated. This recommendation by the board will be gratifying to those who have noted the unwarranted neglect of this method of disposing of small quantities of sewage. It must be used with caution, of course, for a cesspool in soil from which a water supply is obtained is most dangerous, but where coarse sand or gravel occurs and there is no water drawn from these beds, nature has provided the best of facilities for satisfactory sewage disposal.

Ship building is exceptionally active at the coast this year, according to our Vancouver correspondent. The shipyards in North Vancouver have been kept busy since their opening. The British Columbia Marine Railway yards are also very active, while extensive repair work is being done at the Vancouver shipyards.

Practical Ideas for Builders

Henry E. Wilson believes that he has accomplished a long experienced need in a device which permits swinging a radiator out from the wall to permit cleaning or to give access to the wall. Mr. Wilson's invention, on which he recently secured letters patent, does away with the inconvenience of a fixed radiator. The fixture is so arranged that the radiator can be pulled from the wall on rollers, which are attached, without interfering with the work of the steam or hot water plant.

To prevent forms sticking to concrete, a mixture of kerosene and vaseline has been successfully used and has been found particularly advantageous on exposed surfaces. The kerosene acts as a thinner, and soaks into the wooden forms, leaving a thin coat of vaseline, which readily disappears on exposure to sun and weather, after the removal of the forms. A light-colored axle grease in one instance prevented steel forms sticking to concrete, though ordinary black grease failed to give the desired results.

The "Painters' Magazine" describes a method for waxing a cement floor, so that the room can be used for dancing. Cement floors are, as a rule, too porous to be waxed successfully without being first filled. Though rather expensive, shellac varnish is the most convenient and best adapted material for preparing the floors in the shortest possible time. Two thin coats of orange or brown gum shellac dissolved in denatured alcohol will give the proper foundation for the wax. This should be ordinary floor wax, applied with a cloth or brush, and polished with a weighted floor brush, in the usual manner. The application will produce a fine dancing floor.

The causes of decay in building stones are various and depend on the physical structure of the stone, its composition and the nature of the surrounding atmosphere says the "Building World."

The most destructive agent to which the stone is exposed is rain or a moist atmosphere, and also, in a minor degree, wind, frost and smoke.

The air of large towns is usually charged with various deleterious acids; these acids are dissolved by the rain, which penetrates the stone in a greater or less degree according to its physical structure, and combines with the constituents of the stone, causing it to decay, so that any contrivance that will check the admission of water will be most likely to succeed in arresting decay.

Great differences of opinion exist regarding the best composition for painting the floor of the porch, and as to what should be done under certain conditions. In one case where the porch faces the south, and a portion extends around the west side of the building, the owner used ready mixed oil paint, but the result was that it soon blistered and had to be scraped off. The floor was then painted with a well known floor paint, which is sold ready for use. This did not blister, but within two months it came off in flakes. The floor is of yellow pine, and the ground in its vicinity is somewhat damp, the ventilation under the porch being rather poor. The "Painters' Magazine," to which the owner of the porch stated his troubles, makes these suggestions:

"We would advise you to provide proper ventilation, if possible, under the porch floor, because we think the original blistering was due to the dampness under the floor. That the second painting flaked was not unlikely due to inferior varnish in the paint and an insufficiency of oil to bind it. Before applying more paint the floor should be well cleansed and permitted to dry thoroughly. Then a thin coat of pure lead in oil, tinted to nearly match the finish desired, and thinned two parts raw linseed oil to one part turpentine and a very little drier, should be applied and well rubbed into the wood. Allowing this to become hard two coats of a high grade exterior floor paint should be given, each coat carefully brushed out, or a first-class ready-mixed house paint that is somewhat reduced with turpentine could be used in place of floor paint.

"If you prefer to mix your own paint we would suggest that you mix white lead and zinc in equal proportions, tint to color desired and reduce for application with six parts raw linseed oil, three parts turpentine and one part drying japan. This will do for both second and third coats, but for the latter coat the addition of a small portion of hard drying varnish would be an improvement."

Mark Twain's Country Home

How Mark Twain built an Italian villa without seeing it is told in "Country Life in America" for April. The article describes "Stormfield," the humorist's new country home among the Connecticut hills. Here is an extract:

"The joy of country life has entered deep into the soul of the man. He loves the seclusion that his fame will not permit in the city, but he loves people, too, and draws about him from the outside world friends of his own choosing. He loves the house itself.

"It was designed by John Howells, son of *the* Howells," Mr. Clemens tells you, "and he and my daughter Clara and Miss Lyon planned out its particulars and built it, and they did it without any advice or instructions from me. I had every confidence in their taste and judgment and none in my own. My meddling would only have made confusion. I was not willing to discuss the plans nor look at the drawings. I merely said I wanted three things—a room of my own that would be quiet, a billiard-room big enough to play in without jabbing the cues into the wall, and a living-room forty by twenty feet. For the rest they could do as they liked, and I had nothing more to do with the house until I drove up from the station last June to occupy it. I didn't want any of the bother of building. I had enough of that in Hartford when we built a $20,000 house on a $10,000 lot at a cost of $155,000. The only other stipulation was that the house should cost a certain sum."

"Did it?" I asked.

"Well, half of it," the philosopher admitted, smiling.

The Kootenay Engineering Works and the Nelson Iron Works state that the demand in their line is stable in the Kootenays, and will be greater than ever before during the season. The demand for machinery has steadily grown for many years. This particularly applies to sawmills, both for ordinary repair work and new machinery. Among the largest orders were those of the Bowman Lumber Company's, along the Arrow Lakes. Many other lumber companies have been ordering freely.

Personal Mention

Mr. Charles Brandeis, consulting engineer, Montreal, Que., has removed from 63 Guardian Building to 4 Phillips place.

Messrs. Galt & Smith have appointed Mr. E. L. Miles, of Bala, Ont., to take charge of construction work in connection with water supply and sewage disposal at Wetaskiwin.

Mr. G. L. Law, of Ottawa, Ont., has been appointed Government Inspecting Engineer on the Grand Trunk Pacific, Winnipeg, Man., vice Mr. A. L. Ford, who has been transferred to Prince Rupert.

Mr. N. H. Brydson, of Pembroke, Ont., has been appointed city engineer of Nanaimo, B.C.

Mr. George W. Wright, of Toronto, has been appointed assistant city engineer of London, Ont.

Mr. L. Craufurd, City Engineer of Nelson, B.C., has resigned. Applications are being received for the vacancy.

Publications and Catalogues

Those interested in concrete construction may find it worth while to secure a copy of the monthly bulletin issued by the Universal Portland Cement Company, Chicago. The possibilities of the cement manufactured by the company are demonstrated in well illustrated articles. Copies of "Portland Cement Sidewalk Construction," published by the company, are again available, a second edition having been received from the press.

Theatres—Wm. P. Gerhard, C.E.; Bates & Guild Company: Boston, Mass.—Every progressive Canadian architect and engineer will find much that is instructive in this publication. In view of the rapid growth of our Canadian cities and towns and the increasing demand for sanitary, safe and convenient theatres and amusement halls, no advanced member of the profession can afford to neglect reliable information connected with the design of theatres so as to assure their safety from fire and panic, and promote the comfort and health of those who patronize them. Mr. Gerhard is so well known as an authority upon sanitary matters that he needs no introduction from us. We cordially recommend all interested in this phase of construction to secure a copy of this work.

In modern buildings of almost every description there is an increasing demand for the taking of every measure that will reduce to the minimum the danger of fire. In the equipment of the structure nothing is of greater importance than to see that adequate measures are taken to prevent the spread of fire by means of doors, windows and elevator openings. A firm who are able to fulfil any requirement in the latter connection are Messrs. A. B. Ormsby, Limited, Toronto and Winnipeg, of "Underwriter" fireproof door fame. We have just received from this firm a carefully compiled and effectively illustrated catalogue and are impressed with both the merits of the various lines and the progressiveness of the manufacturers. This catalogue is believed by its compilers to be the most comprehensive of its kind ever issued and our readers will do well to secure a copy of the same and get in touch with Messrs. Ormsby.

Sanitation and Sanitary Engineering—W. P. Gerhard, C.E.: published by the author, 33 Union Square, New York City; price $1.50. In this book Mr. Gerhard has compiled a work which all engineers, having anything to do with municipal or sanitary undertakings, will find invaluable. The author also gives a great deal of information which will be especially instructive to municipal officers seeking the non-technical outline of the field of sanitary engineering. Architects, again, will find a reading of this work at once interesting and profitable. The book is admirably indexed for ready reference to any branch of the subject, and unlike so many of the more comprehensive works, it supplies desired information readily and with the aid of but few abstruse or scientific terms.

The International Portland Cement Company, Limited, of Ottawa, Ont., have published an attractive and artistic souvenir dealing with the history, development and future of Portland cement. To all interested in constructional projects, this publication will be more or less a revelation. When looking over the excellent illustrations of the many important works, one is impressed with the fact that no up-to-date architect, engineer or builder can afford to remain in ignorance of the truths concerning Portland cement, its production and methods of use. The expert opinion published in this souvenir cannot be gainsaid. The laboratory tests, in connection with the cement manufactured by the company, prove conclusively that International Portland Cement has attained a very high standard. The progress made in cement manufacture in recent years is indeed astonishing, and after a study of this souvenir the reader cannot but be persuaded that no product has a wider application to useful purposes than cement. Of more than passing interest is the historical outline included in these pages. Many an otherwise well-informed reader will be surprised to know that the manufacture of cement dates back probably to the Egyptians of four thousand years ago. A more extensive use of the material was made by the Romans, who discovered a process for manufacturing a hydraulic cement by burning clay nodules, containing lime and iron, and mixing the product with lime and sand. To the average mind it seems strange that the Romans had no imitators up to the time of John Smeaton, a celebrated English engineer, in 1756. The Eddystone lighthouse, constructed by Mr. Smeaton, is a monument not only to the excellent of the cement, but to his own ability and zeal. Later developments are equally, if not more, interesting, and any of our readers will be well repaid for the trouble of writing to the International Portland Cement Company for a copy of this souvenir.

The Canadian Pacific Railway is at present engaged in building what is to be the largest bridge in the world. It is being constructed over the Belly river at Lethbridge, in Southern Alberta, on the Crows' Nest branch of the line, and will be completed this year. It will be more than double the height of the ill-fated Quebec bridge, namely, 307 feet, and its length will be 5,327 feet.

The Macdougall firm, of Montreal, were about two years late in finishing their contract for the building of the high level pumping engine for Toronto and are liable to pay the city a penalty of $28,000. City Engineer Rust advised the Board of Control to temper justice with mercy, and ask only $5,000 of the penalty. The City Solicitor will report on the matter.

Attention, application, method and dispatch are the principal qualities required for the efficient conduct of business of any sort. The most successful men are the most exacting in the smallest details of their business.

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Pointers on Ventilating Methods

Of the two general systems of ventilation, "natural or automatic" and mechanical, the former is usually (but not always) considered the most economical, and the latter the most effective, said M. Aldous before the Institute of Sanitary Engineers at a recent meeting of that body.

To bring about the constant changing of the air, inlets as well as outlets are required to every room or compartment, and these appliances should be used with extreme care, otherwise it will soon be discovered that practice will in this case, as in most others, upset the theory laid down as to given laws.

Dealing with the outlet first, I fail to see how there can be such a thing unless it is absolutely proof against down-draught, as it cannot admit the cold air from the outside (which many so-called ventilators do, thus causing a down-draught) and at the same time extract the hot or vitiated air from the inside. All outlets, whatever form they may take, should be placed at the highest point of the place requiring relief; and too much dependence should not be placed upon the apparatus used.

There are very few automatic ventilators with any extracting power. The majority are not extractors, but intakes of wind and air except under very favorable circumstances. The apparatus used can not be too simple in its construction so long as it is effective. It has been proved in many ways that a rotary cowl is no assistance to ventilation.

When applying fresh-air inlets great care should be taken as to the position in which they are placed, or they will have a destroying effect upon the extractor, or, maybe, a deleterious effect upon the occupants. They should be placed above the height of any person who may be standing near them and also below the lights. If placed above the lights from which the heat or vitiated air is thrown off, there will be the same effect as if air were coming into the extractor; for the cold air coming in above the hot air, or the heavier above the lighter, will cause the latter to fall instead of to rise and escape at the place where provision is made. By placing the inlets below the lights, or hot air, they will act as a help to the hot air in rising.

Changes of air can be brought about automatically if the appliances are carrectly placed; but sometimes they are so placed that they have a direct contrary effect to that intended. Let me quote an instance. A short time ago my father and I were requested to test the ventilation at a Wesleyan chapel. We found the following conditions and results: On the roof were three large ventilators as extractors (so-called). On the north side of the building were five Tobin tubes, and on the south five also. The wind was blowing from the south, at a velocity of from four to five miles per hour. On testing the inlets (or Tobin tubes) on the south side we found there was an inlet of fresh air of 6,000 feet per hour through each tube. We then tested those on the north side, which were sheltered from the wind, and found they were extracting at the rate of 4,000 feet per hour through each tube. Where the inlet or intake was, it was more of a forced current than the bringing-in of fresh air, in the true sense of the word, because the wind was blowing directly into the collecting bonnets of the air tubes. Now, if the forced current is deducted from the natural inlet of fresh air—as it should be—these inlets, taking them as a whole, were perfectly useless; the reason being that the ventilators and inlets were not working together or helping each other, but quite the reverse, for the so-called exhaust ventilators were acting as inlets, thus bringing down volumes of cold air high above the Tobin tubes. The air thus brought in being more powerful than the air inside, caused a displacement of the existing air and so force it out at the inlets. It will thus be seen that inlet ventilators do not always act as inlets, and, therefore, care should be taken in applying them.

Again, when more than one inlet is used in the same room a great mistake is often made by not placing them at the same height; if they are not so placed one will act contrary to the other.

Another great mistake is made with respect to fresh air, and very frequently by architects. This is by such apparatus as fans, punkahs, water-sprays or any other moving apparatus supposed to create air. The water-spray or fan simply displaces the surrounding air and on its amalgamation produces a cooling effect. That is all. Water-sprays or fans are of no assistance to ventilation in the way which ventilation should be brought about; neither by creating nor bringing in fresh air are they of any use.

No automatic apparatus placed in a room at a temperature of 50 degrees Fahrenheit can draw in the outside air of the same temperature; if such were the case it would entirely destroy the theory of spontaneous diffusion of two columns of air by their unequal density.

If a room is tested with fifty people in it the temperature will be found to be lowest at the floor line. To reduce the weight and increase the temperature, cold air should be brought in above it. This may appear strange, but it is so. If openings are made in the room one foot or fifteen inches above the floor line to admit fresh air, and a thermometer is placed one foot above the floor line, the mercury will rise, even if the air admitted is colder than the general temperature of the room.

To deal with the carbonic acid gas, collecting bonnets should be placed under the floor; and connected with them should be tubes conducted up behind the stove; the ends which discharge the gas should be somewhat below the fire, so that the heat will destroy the acid, reduce its weight, and so help it to rise and escape up the chimney flue. This is a way the heavy gas can be effectually dealt with, and it will also show how effectually a change of air can be brought about either by natural or mechanical means.

Of the lighter gas, sewer air is, of all others, the most dangerous, while still more deadly is carbonic oxide, though not nearly so dangerous or so much to be feared as either of the other two gases, inasmuch that there is always a warning with it—it being made by fire.

I am very skeptical about the ventilating powers of the ordinary types of fans. Let us look at some of their names—the air propeller, the cyclone, the blast, the hurricane, and various other names signifying their capabilities; but if they were called air churns it would be more appropriate, for displacing the existing air and causing a powerful wind is not changing the air, and unless the apparatus employed has a perfect and complete contact with the object it is required to move, the results aimed at can not be attained. On the other hand, if the apparatus is applied and carried out scientifically, then mechanical ventilation can be made a success.

All the supplies to be moved, either as intakes or outlets, must be connected to an accumulator or collector; and the accumulator to the fan or fans, and all parts being perfectly air-tight, the contact is brought about, and thus it operates. Every space is full of air, and no more can come in until some is moved out.

Material for Service Pipes

The quality of the work done by the plumber will depend very greatly upon the quality of the pipes which he uses in its prosecution, says "Shoppell's." All service pipes should be of the best quality, or the work will be a failure from the beginning. Various kinds of material are used for service pipes in different localities, and they are usually chosen in accordance with the adaptability of the water to the material of which the pipe is composed.

Plain iron pipe is non-poisonous, cheap, and easily jointed, but it soon gathers rust, which fills the bore of the pipe and eats it away, necessitating the replacement by new pipe. Galvanized iron, or zinc coated iron, will retain its coating on the inside a little longer than plain iron, but when this coating begins to scale, as it will eventually, the water may become dangerous to health, as the salts of zinc are poisonous with some waters if taken in sufficient quantity. Tar-coated iron is used extensively on account of its cheapness, but its inner surface of tar will be removed by friction in less than a year. Its advantage lies in the fact that outside contact with all kinds of soil will not affect it as rapidly as it will plain iron. Plain iron is affected by both outsile and inside corrosion, so that its decay is hastened.

Pure tin pipe is perfectly safe and non-corrosive, but is difficult to work. It is very liable to crack at the edge of the joint, and leaks are difficult to repair. The lined lead pipe is less expensive and easily worked.

Brass pipe is very durable if properly annealed, is light, strong, and easily jointed. It is said to be poisonous, however, when used to conduct water for drinking purposes. Copper pipes are not used as a cold water supply, but are frequently used on hot water connections between the range and the boiler. They are very durable and well adapted for this purpose. Lead pipe is durable, strong and pliable, but with some soft waters it corrodes, and, if soluble, becomes injurious to health.

Lead is generally preferred for house connections, on account of the facility with which it can be adapted to the structural requirements. The real objection to it is, that it is attacked by some very soft waters, oxide of lead being formed, which is partially soluble. With free carbonic acid, however, the pipe becomes coated with carbonate of lead, which is insoluble in water and protects the pipe from further action. In hard water the lead soon becomes coated with sulphide of lime.

It is only, therefore, under exceptional conditions that the employment of lead in service pipes is harmful. It should be prohibited, however, for the lining of tanks or cisterns for domestic use, where the flow of the water may be stopped for any length of time. Lead and tin linings for iron pipes are now obtainable, and these pipes have the rigidity of iron and the smoothness of bore desirable. In trench work these pipes are very popular, as they prevent trapping and avoid obstruction to the flow of water by being air-bound.

The History of Hot Water Heating

The hot water system of heating houses is nearly two centuries old, the first successful trial of hot water heating having been made about 1716 by Sir Martin Triewald, a Swede, who resided in England, says Shoppell's. He devised a method of heating a greenhouse by hot water. The water was boiled outside the building and then conveyed by pipes into a chamber under the plants. The first attempt at hot water heating on a large scale was made in France, in 1777, by M. Francis Bonnemain, in an apparatus for hatching chickens for the markets of Paris. It long remained as a model for many heating plants planned and erected.

Hot water heating was not introduced into America until about 1850, and it was 1875 before it was taken up by engineers and artisans generally. Since 1890 its use has grown very rapidly. It is cleanly, healthful, economical, and easily regulated, and air so warmed has a delightful effect on the body. In arranging for a hot water heating plant, the owner of the home should insist that the apparatus provided have ample capacity. It will give better results to work a large plant at a moderate temperature than a small one at its maximum capacity.

Ventilating a Ball Room

In designing the ventilation apparatus for the ballroom of the Hotel Plaza, New York, it was necessary to take into account the different purposes for which the hall will be used, as well as the variations of working conditions due to climatic influences. Under normal conditions the ventilation of the ballroom will be effected in a downward direction, air being supplied from ducts with openings near ceiling level, and exhausted through openings at lower levels. Provision is also made for delivering air from the lower exhaust openings anl exhausting it from the ceiling openings, thus reversing the direction of the air currents. The scheme of reverse ventilation was specially devised for use on occasions when part of the balcony will be lowered to form a temporary stage for theatrical purposes, but will probably be found serviceable during the progress of balls and entertainments in warm weather. A good deal of controversy has taken place concerning the relative merits of upward and downward ventilation, and it seems probable that this new ballroom will furnish some interesting experience.

According to the "Medical Press and Circular," at the town of Bahe, in Switzerland, a decree has been put in force prohibiting the occupation of houses within four months of their completion. It has been estimated that a modern brick dwelling of medium size requires about 10,000 gallons of water in its construction, much of which is still present when the workmen withdraw. Heat is of less use in geting rid of this moisture than free ventilation To light gas in rooms with a view of drying them is a capital mistake, since all the hydrogen in the gas is converted into its equivalent of water.

Investigations of Cement Tile Manufacture

Mr. Wm. H. Day, lecturer in physics at the Ontario Agricultural College, in his annual report describes some investigations which he undertook in connection with the use and manufacture of cement tile for drainage. Mr. Day's report on the matter is as follows:

We have had many enquiries as to the cost of making cement tile, so we determined to make some in order to inform ourselves on the point and enable us to answer the question. We wrote the London Concrete Machinery Company, of London, Ont., telling them our purpose and they kindly donated to the department one of their tile machines, and with it our tests were made. Mr. A. M. Shaw, a third year student, who has had considerable experience with cement and who is investigating some phases of drainage for his fourth year thesis, made the

Some difficulty was encountered at first in getting enced man.

tests for us, so that the work was done by an experi- the mortar of the right consistency. It must be wet enough that the tile will make the "initial set," yet dry enough that they will lift off the moulds without sticking. The wetter they can be made and yet come away smooth the better the cement. At first to get them to come off right we had to mix the mortar so dry that onlookers vowed the tile would "never set," but they did, provided they were kept shaded so as to remain moist for about a day. If exposed to the hot sun or a drying wind or both during the first few hours they dried out too quickly and would never make good tile. Water is essential to the proper setting of cement. By oiling the moulds, however, we found that the mortar could be made fairly wet and yet the tile not stick, but come off smooth and perfect in shape. Still the mortar was far from what is known as "slush" and hence there was not in it enough water to make good cement, and it was found that the direction accompanying the machine to "keep the tile moist for one week after making" was a very essential part of cement tile manufacture. On no account should this direction be violated.

The proportions of sand and cement is a matter of choice. The directions say 7 to 1, but we used mostly 6 to 1. Either makes a tile strong enough to withstand all the pressure to which it will ever be subjected. As to durability, we are not in a position to speak from actual test, but very energetic investigations are being carried on at several experiment stations in the United States to determine the life of cement tile. Montana has shown (Bulletin 69) that alkaline waters in the soil will bring about the disintegration of cement tile in a few years. This week I am in receipt of a pamphlet published by Brick, of Chicago, giving results of investigations carried on by Messrs. G. G. and A. J. Wheat, of Emmetsburg, Ia., assisted by Dr. Nicholas Knight, chemist, of Cornell College, Mount Vernon, Ia. These gentlemen give what appears to be indisputable evidence that thoroughly cured cement tile six months old, 1-5 cement and hard and strong almost as a clay tile, is soluble in water, so much so indeed, that at the same rate all the cement in it would be dissolved in about 3 3-5 years. In ordinary soil water it was a little less soluble. Hence with water continually passing through the pores (cement tile is very porous) the tile in the drain must in a few years reach the point of disintegration, much as a soft stone crumbles. They also claim that acid soils are especially destructive of cement tile. I am also in receipt of a booklet, published in Detroit, entitled "Cement Tile,' devoted to the refutation of the arguments set forth in the "Brick" pamphlet. It claims that Messrs. Wheat's investigations have been limited, and biased, and moreover their own figures show that the rate of solution drops off rapidly, that only a small portion of the cement is soluble, and that hence the tile cannot "crumble as so much sand," as Mr. Wheat claims they will. After reading both pamphlet and booklet one is still left wondering whether cement tile will really prove durable. A year or two of investigation should pretty well settle the point.

Now as to cost: Mr. Shaw found that six cubic feet of sand and one bag of cement (a bag contains approximately one cubic foot) would make 78 complete 3-inch tile, say 75, in case a few might be spoiled, and that he could make one "batch" in one hour and 25 minutes, doing all work himself. At this rate he would make 546 complete 3-inch tile in a day, at 78 tile per batch, or 525 at 75 per batch. With these facts to work with and knowing the price of materials in his own locality any man in Ontario can calculate for himself at what cost he can make cement tile.

The hauling of material may be offset against the hauling of clay tile, so that arriving at a comparison between the two this factor may be omitted. Let us "figure" on a day's work for one man. 525 tile—7 batches—approximately. Therefore 7 bags of cement, or 1¾ barrels are needed, and seven times six cubic feet, or 42 feet of sand, or about 1½ yards of sand. Hence for one day's work the outlay would be:

1½ yards sand at 8 cents	$ 12
1 day's wages at $1	1.00
1¾ barrels cement at $1.90	3.33
Total for 525 tile	$4.45

At this rate 1,050 tile would cost $9.90, and 1,000 tile $9.38. The prices quoted by the gentleman are lower than can be obtained in Guelph, and they are probably lower than in many other parts of Ontario, but as pointed out before, the reader can use the prices prevailing in his own district and determine the cost of making this kind of tile. And if he finds that he can make the tile cheaper than clay, then he must consider whether the difference is sufficient, and whether he needs enough tile to pay him to go to the expense of buying a tile machine. This first cost, as well as some other details, may be best answered by reference to the instance now about to be given.

In the early summer one of our field men made a survey for Mr. Clarence Abbott, of Cultus, Ont., some 14 miles south of St. Thomas. He found Mr. Abbott with a complete outfit and making his own tile in large quantities, and on his return reported the matter to me. In the autumn, in order that I might have some information from the practical side, as well as from our own laboratory tests, I wrote Mr. Abbott asking him a long list of questions, which he very kindly answered. I give the questions and answers below:

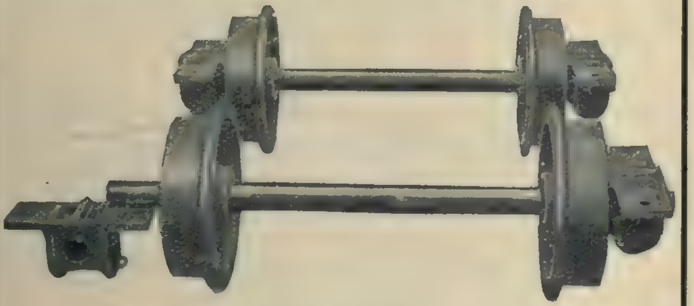
1. Q.—What did your machine cost? A.—My machine is a London one and cost $170 with four outfits and 100 pallets.

2. Q.—For what sizes is it equipped? A.—Eight-inch, six-inch, four-inch and three-inch.

3. Q.—What number of pallets of each size, and the cost thereof? A.—20 8-inch, 30 6-inch, 30 4-inch, and 20 3-inch. All pallets cost 50 cents each.

(Continued on page 40)

Car Trucks



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(Continued from page 38)

4. Q.—What preparation in the way of platform, shelter, etc., did you make, and what was the cost thereof? A.—I made a platform 10 feet by 14 feet, of brick laid flat on the ground, on which I mix the concrete and operate the machine. All the shelter required is something to keep the sun off while you are working. I used a tent cover which I happened to have. I made racks to hold pallets while tile are curing, sufficient to hold 100 pallets, by setting posts two feet apart and two feet above ground and nailed boards on inside along the top. This saves a lot of stooping work and keeps the tile from being broken while green. The most essential part is to have a good supply of water elevated enough to sprinkle through a hose. For this purpose I used three barrels connected together by means of short pieces of hose and placed on platform eight feet high, and forced the water with a windmill. The cost of my plant did not exceed $25.

5. Q.—What strength do you make your mortar? A. Seven parts sand to one of cement.

6. Q.—How many complete 3-inch tile can you make from one bag of cement? A.—I cannot tell exactly as I have not pallets enough to test it, but I think about 125.*

7. Q.—What does your cement cost? A.—$2 per barrel.

8. Q.—The cost of your sand? A.—I used mostly pit gravel sifted, which cost 15 cents per load at the pit. I also used lake or beach sand, which I like better, but it was too heavy to haul.

9. Q.—What number of men do you find economical to operate the outfit? A. Two, one to mould and the other to wait on him.

10 Q.—The cost of labor per day? A.—$1 with board.

11 Q.—How many 3-inch tile per day can your men make if working steadily on that size? A.—600.

12 Q.—What is your estimate of the cost of your tile compared with the cost of clay tile? A.—Two-thirds to three-quarters the price of clay tile.†

Before leaving the subject of cement tile, I should like to say that while the question of durability of cement drain tile is being settled, and while cement tile machinery is being perfected, it might be as well for Ontario farmers to go slowly in the matter of adopting cement tile.

*The estimate of 125 is probably a little high. At 6 parts of sand to one of cement we made 78 tile from one bag, and at 7 to 1 the number would be approximately one-sixth more, or 91.

†This estimate does not differ greatly from the calculation made on the prices at Belgrave.

Grand Forks, B.C., reports building construction there very active.

The city of Victoria is contemplating the borrowing of half a million dollars for the purpose of constructing better streets in the city.

Applications are invited until May 15th, by J. A. Mason, Battleford, Sask., for the combined positions of Secretary-Treasurer and Publicity Agent of Battleford. Salary, $100 per month.

Mr. John Love, father of Messrs. Henry W. and Percy Love, of Love Bros., Limited, the well known Toronto contractors, died recently at his home in Toronto. Mr. Love was 64 years of age.

The town of Fernie, B.C., is said to be very active in the building line. The C.P.R. depot has just been completed, the new school is being built, and many residences are going up in different parts of the town.

AMHERST RED STONE QUARRY CO.
AMHERST - N.S.
Amherst Red Stone
Samples sent Free Hardens with Age Correspondence Requested

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Quarriers and Manufacturers of
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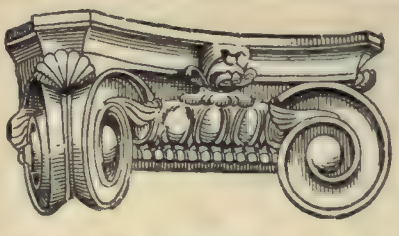
Monumental Building, Curbing, Paving, etc. Rough Stock a Specialty
IBERVILLE, QUE.



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Interior and Exterior
Modelling and prices given. Send for Catalogue
J. CLAPHAM & SONS
14 Main St. East - - HAMILTON, Ont.

The Grey & Bruce Portland Cement Co., of Shallow Lake, Limited
MANUFACTURERS OF
"HERCULES" Brand of PORTLAND CEMENT
Very finely ground. Unsurpassed for Sidewalks, Floors and all work requiring the highest grade of Portland Cement. For prices address
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Laurentian Granite Co.
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MANUFACTURERS OF
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RAILS For Contractors, Switches, Girders, etc. New and Second Hand.
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John J. Gartshore
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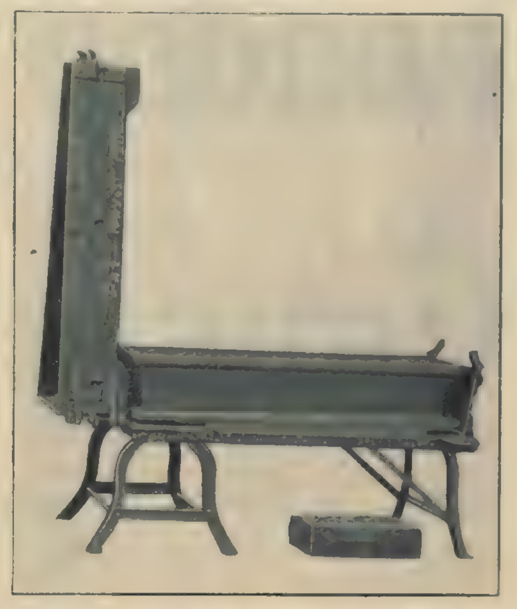
Let us send you our catalogue and make quotations on your next bill.

McCormack & Carroll

82 Adelaide Street East, TORONTO

Maple Leaf "A" 16 in. Outfit Combined Adjustable Block and Sill Machine

Wake up to the times and for the love of you don't buy a half dozen machines to put up one building as you have in the past.



SHE'S A DANDY ONLY $75.00 A WHOLE FACTORY

Above cut shews a beautiful 4 ft. step and a 4 in. block, which speaks without words of the great variety of materials that can be made on this wonderful machine. It will make your foundation blocks, fractional blocks, 4" to 16" long, sills, steps, lintels, coping, curbing, belting course, etc., up to 4 ft. long.

We have sill machines for work that is too heavy to lift 8" x 12" x 6'0" for the small sum of $17.50.

Write for catalogues and information to

Maple Leaf Concrete Machinery Works
J. C. Yarwood, Proprietor - Brockville, Ont.

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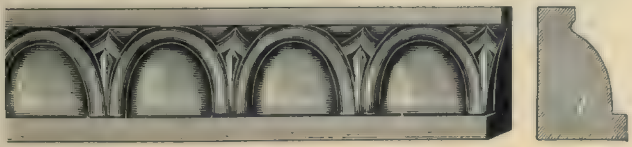
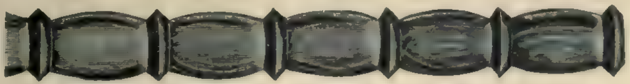
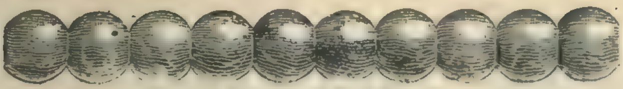


No. 300 in Catalogue. Embossed Moulding. Size, 7-16 x 13-16 inches.



No. 84 in Catalogue. Turned Moulding.



No. 74 in Catalogue. Bead Moulding.

We are manufacturers of Embossed, Plain, Carved and Turned Mouldings, and are in a position to supply your wants quickly. Specially selected wood that has been perfectly kiln dried, is used in all our work. This, along with superior workmanship in shaping and designing, enables us to produce mouldings that are ahead of any.

We have a large variety of patterns and woods from which to make selection. Many of our mouldings are carried in stock, and any requirement not in stock can be made to order quickly. We want Maritime Province and Western Trade as well as Ontario and Quebec.

Our new catalogue is most complete. Write for it to-day.

The S. Knechtel Wood Turning Company

Southampton, Ont.

London Automatic

Continuous Batch

Concrete Mixers

are made in several sizes and furnished with any equipment.

This Machine is **Automatic in all its Operations.**

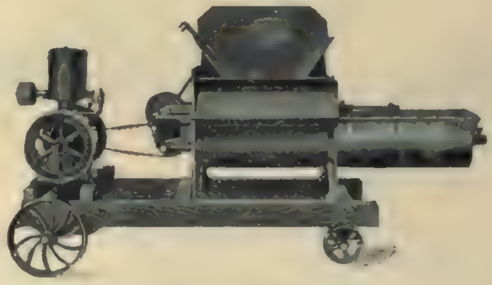
All you have to do is **keep the Hoppers full.**

The London is in a class of its own.

Note our special features:

A Batch Feed and a Continuous Mixing Trough.

Do not get this machine confused with other machines having a continuous feed. This machine measures thirty-two batches per minute, and will mix any kind of material up to 3 inches in diameter.



London Automatic Mixer No. 1
Capacity 40 yards per day—Price $275.00.

London Automatic Mixer No. 2
Capacity 120 yards per day.

We manufacture a full line of Concrete Machinery including Brick Machines, Face-Down Concrete Block Machines, Ornamental Lawn Vase, Baluster and Column Moulds, London Adjustable Silo Curbs, London Adjustable Sill Step and Window Cap Moulds, Sewer Pipe and Tile Moulds, Fence Post Moulds, Pier and Chimney Block Moulds, Concrete Cars, Wheelbarrows and Carts, Cement Working Tools.

Our large illustrated catalog will be sent free for the asking. Tell us your requirements.

London Concrete Machinery Co.

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19 Marmora St., LONDON, Ont.

We are the Largest Manufacturers of Concrete Machinery in Canada

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For Concrete Construction, Roadways and Sidewalks, we carry a Light Weight Stone, especially suited for Reinforced Construction Work.

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This should insure a constant supply for all our customers. Prompt Shipments via C. P. R. and G. T. R.

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Built Verandah Columns, Turned or Built Newels or Balusters

Pine Doors, Frames and Sash

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We can supply any or all of the above items and any class of interior work.

We guarantee Quality and Workmanship, and successfully meet the competition of those who feature only one or two lines.

We solicit your orders. We ask for the privilege of quoting on your bills.

A line from you at any time will bring a call from us.

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Midland - Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Brandon, Man.
There are indications that the construction of the proposed trunk sewer will be commenced this season.

Cobalt, Ont.
The Ontario Railway and Municipal Board have validated the town's bylaw to raise $75,000 for a sewerage and waterworks system.

Collingwood, Ont.
The ratepayers will vote on May 27th on a bylaw to issue $6,000 4½ per cent. 10-year water and light debentures.

Carman, Man.
A bylaw will be voted on May 21st to issue $25,000 five per cent. 30-year waterworks debentures.

Calgary, Alta.
The Calgary Paving Company have submitted to the City Council the following comparative costs of paving First street W. subway, 400 feet in length, 26½ feet in width: Asphalt on a 5-inch concrete base, $3,237.67; double track street railway; 400 feet in length with two rows sand stone blocks each side of each rail, asphalt paving in between, $4,800; total, $8,037.67. "Cobbloid" over entire surface (except the two rows of sandstone blocks on each side of each rail) and upon a 6-inch concrete base, $4,591.60; street railway, $5,260; total, $9,851.60. "Cobbloid" on each side of railway tracks, asphalt between tracks and devil strip, $4,591.60; street railway, $4,800; total, $,391.60. Twelve rows (6-inch wide) sandstone blocks both sides of street railway tracks, and the balance asphalt (except the two rows sandstone each side of each rail), $4,971; street railway, $4,800; total, $9,771. Entire surface sandstone blocks, $7,064; street railway, $6,100; total, $13,164.

Deloraine, Man.
Notice is given of the town's intention to carry out certain local improvements, including sidewalk construction on North Railway avenue, South Railway avenue, Broadway street, Morton avenue and Mountain street. D. L. Livingstone is secretary-treasurer.

Estevan, Sask.
The time for receiving tenders for water works system and main sewer has been extended to Wednesday, May 26th. (See advertisement.)

Gravenhurst, Ont.
The ratepayers will probably be asked to vote on a by-law to raise $20,000 for a new waterworks system.

Hamilton, Ont.
At a recent meeting of the Board of Works, it was decided to take tenders for the construcion of a sewer on Robert street from John to Catherine streets. The recommendation for the construction of a pipe sewer on Boulette street, from May to Jackson streets. was adopted at the same meeting.

On account of the high prices submitted, the Board of Works Committee has taken no action in regard to the West End disposal works.

Merrickville, Ont.
The ratepayers will vote on May 17th on a bylaw to issue $10,000 twenty-year, 4½ per cent sidewalk, drainage and street improvement debentures. J. Johnston, Clerk.

Moose Jaw, Sask.
The city asks tenders for laying water and sewer mains. Plans prepared by City Engineer J. Durlington Whitmore. (See advertisement.)

Macleod, Alta.
Work is to be started at once on the $50,000 sewerage system.

North Toronto, Ont.
Mr. T. Aird Murray, C.E., has presented to the council an exhaustive report on a proposed sewage disposal system, in which he states that a biological sewage disposal system for the town would cost $131,241, and if connected with the city's system would cost $241,541, inclusive of the city's rental. The report and project are viewed favorably.

Oak Bay, B.C.
The ratepayers will vote June 15th on a bylaw to raise $30,000 for thei nstallation of a waterworks system.

Peterborough, Ont.
The water commissioners are calling for tenders for waterworks plant for the city. (See advertisement.)

Picton, Ont.
The Board of Works recommends the expenditure of $4,000 on streets, walks and culverts this season.

Port Arthur, Ont.
City Engineer Antonisen is preparing estimates for proposed extensions to the waterworks and sewerage plants.

Stellarton, N.S.
At a recent meeting of the town council the chairman of the water commissioners reported on the proposed extension of the water service to Lourdes and the Allen Shafts colliery. It will require 11,121 feet of pipe, and the total estimated cost of the work is $11,826.05. The matter is in abeyance.

St. Thomas, Ont.
Tenders are asked by the city for building a sewage disposal plant. (See advertisement.)

St. Catharines, Ont.
Tenders addressed to D. Benzie, City Engineer, will be received until May 14th for the construction of sewers on College and Ann streets.

Toronto, Ont.
The Rosedale Golf Club has received permission to lay a 6-inch water main from Yonge street to their club-house, a distance of 1,200 feet, at their own expense.

City Engineer Rust has been authorized by the Board of Control to take tenders for sections four and five of the trunk sewer.

Vancouver, B.C.
At a recent meeting, the reeves of Point Grey, South Vancouver, Burnaby and Richmond decided to appoint Cleveland & Dutcher, consulting engineers, Vancouver, to report on a joint water system for their municipalities.

Victoria, B.C.
The ratepayers will be asked to vote on a bylaw to raise $125,000 by debentures for the extension of the waterworks system. This amount will probably be expended in part for the purchase of 2,500 feet 12-inch cast iron pipe, estimated cost $6,250; 10,000 feet 8-inch cast iron pipe, estimated cost $20,000; 20,000 feet 6-inch cast iron pipe, estimated cost $30,000; 50,000 feet 4-inch cast iron pipe, estimated cost, $50,000. For digging up and re-laying old pipe it is suggested to appropriate $15,000.

W. J. Dowler, Clerk, gives notice of the city's intention to construct permanent sidewalks on Pembroke street and Belmont avenue.

Vernon, B.C.
The city council has received a report from Galt & Smith, consulting engineers, on bringing water from Lang lake to the present power house by natural gravitation. The distance is about 1,400 lineal feet, and it is suggested to lay a light steel wound wooden pipe to allow of a constant flow of 600 gallons per minute, to be increased to 1,000 gallons on emergency. A concrete ground basin to contain 100,000 gallons, a small concrete fire proof power house contiguous to the present power house, a pump room suitable for a duplicate set of pumps, air pump, condensing apparatus, etc. The following is an approximate estimate of the cost complete for the above work covering water supply and improvement to distribution system: 1,400 lineal feet of 14-inch light steel wound wooden supply main, $21,000; extra for steel piping into lake, excavating, laying, etc., $4,000; concrete basin, 100,000 gallons capacity, $4,000; concrete pump house, $2,500; concrete pumping machinery, $5,500; 9,000 feet of 8-inch pressure main and valves, $18,000; engineering and contingencies, $3,000; total, $58,000.

Yorkton, Sask.
The town is making preparations to supply the Canadian Pacific Railway with 20,000 gallons of water a day. Inquiries have been received from other towns wishing to make an installation, the latest being from Neepawa, Man.

Tenders addressed to R. H. Lock, Treasurer, will be received until May 24th for sewer construction. F. T. McArthur is Town Engineer.

AWARDED.

Calgary, Alta.

Bitulithic and Contracting, Limited, of Winnipeg, Man., have been awarded a contract for 45,000 square yards of bitulithic pavement for this city.

The commissioners of the City Council have recommended the acceptance of R. A. Brocklebank's offer to pave a number of streets, approximately 20,000 square yards, at $1.92 per square yard. For the same area $2.50 per square yard was quoted for laying granatoid on a crushed rock base.

Guelph, Ont.

The Board of Works recommended the acceptance of C. H. Conery's contract for laying cement walks at 9¼ cents a foot. H. Barber's tender for cement pipe was accepted.

Montreal, Que.

The Roads Committee have accepted the tender of the Warren Paving Company, at $25,500, for an asphalt plant. The Iroquois Iron Work's tender $33,140 was next.

Regina, Sask.

The city has awarded the contract for 100 barrels of cement to Peart Bros. for $245.

Saskatoon, Sask.

The successful tenderers in connection with water mains and sewer pipe and their tenders are: Section 1, Harry Welch, Saskatoon, $13,725; Section 2, Reginald Boulton, Prince Albert, $17,900; Section 3, William Cook, Saskatoon, $9,756.25.

South Vancouver, B.C.

At a recent meeting of the Council, the contract for supply of lumber for sidewalks was awarded to W. H. Day, whose tender was as follows: Ward one, $14 per thousand; ward two, $13.50 per thousand; wards three, four and five, $12 per thousand, delivered.

St. Boniface, Man.

The City Council has awarded a contract to the National Meter Company to supply the city water meters at $13.26 each.

St. Thomas, Ont.

Tenders for cement and curbing work were received by the City Council as follows: G. A. Ponsford — Cement walks—sand finish, 10¾ cents per lineal foot; cement walks, granite finish, 13 cents per linear foot; curbing, 26 cents per linear foot; curbing and gutter, 36 cents per linear foot; walks, 11 cents per linear foot. A. E. Ponsford — Cement walks — sand finish 10 cents per linear foot; cement walks, granite finish, 12 cents per linear foot; curbing, 23 cents per linear foot; curbing and gutter, 38 cents per linear ooot; walks, 10½ cents per linear foot. The tender of A. E. Ponsford was accepted.

Toronto, Ont.

The Barber Asphalt Company's tender of $35,900 for paving Queen street, from the Grand Trunk Railway tracks to Greenwood avenue with asphalt has been accepted by the Board of Control.

Victoria, B.C.

The following tenders for material required in the installation of the high pressure system were accepted: Fine wire, Hawkins & Hayward, 18½ cents per lb.; stempipe line, Marine Iron Works Company, $350; water suction connections and valves, Marine Iron Works Company, $450; condensing equipment, tender not awarded though the apparatus offered by the Hutchinson Bros. Company, the lowest tenderers, at $1,750, is recommended.

The following tender was submitted to the City Council by the Warren Construction Company, Portland: Bitulithic pavement on a bituminous base, six inches in depth, $2.75 per square yard; curb, 40 cents per lineal foot; sidewalks, 20 cents per square foot; boulevard, 50 cents per lineal foot. If any excavation or filling was required, 30 cents a cubic yard for scraper work, 60 cents for wagon haul, and 80 cents for gravel fill.

Winnipeg, Man.

The Roads Committee have awarded to A. T. Morrison, at $3,450, the contract for the supply of a new steam roller.

Railroads, Bridges and Wharves

Edmonton, Alta.

By the terms of an agreement which has been reached by the city and the C. P. R., the construction of a proposed high level bridge will commence in September next. Estimated cost $1,500,000.

Princeton, Ont.

Tenders are called for building cement abutments for steel bridge in Blenheim Township. (See advertisement.)

Newport, Ont.

Tenders addressed to A. S. Farnsworth, Secretary Treasurer, Newport, Ont., will be received until May 15th for the construction of concrete abutments for a bridge. Specifications at residence of R. F. French.

Toronto, Ont.

Park Commissioner Wilson's plan for the restoration of Dufferin street wharf calls for an expenditure of $25,000.

Tenders will be received until June 1st for the reconstruction of the bridges on Dundas street, over the tracks of the Grand Trunk and Canadian Pacific Railways. John J. Ward, Vice-Chairman, Board of Control.

The plans for the viaduct submitted to the city by the G. T. R. place the cost of the work at $4,600,000 for the viaduct and $2,000,000 for the new station, as compared with eight millions estimated by the C. P. R. engineers. The plans show a viaduct from Bathurst street to Logan avenue for G. T. R. tracks and from Bathurst street to the Don at Queen street for C.P.R. tracks. The Dominion Railway Commissioners have the matter in hand.

Walkerton, Ont.

The Bruce County County will consider a bylaw on June 15th to issue $20,000 twenty-year bridge debentures. P. A. Malcomson, County Clerk.

AWARDED.

Dartmouth, N.S.

The contract for repairing the Ferry wharf has been awarded by the Ferry commission to Reid & Archibald. The tenders were as follows: Reid & Archibald—Furnish and drive piles, $4.50 each; furnish and work lining lumber, $25.00 per m.; furnish and work caps, $19.75 per m.; furnish and work joists, $19 per m.; furnish and work 3-inch plank, $18 per m. These prices all include the furnishing of irons. The entire tender, with the exception of the furnishing and working of the 3-inch plank was accepted, with the proviso that no piles smaller than 9 inches at the small end be used, and that the other timbers be of the standard size. The tender of F. Mosher & Son was as follows: Furnish and drive piles, $5 each; furnish and work caps and joists, $20 per m.; furnish and work lining timbers, $25 per m.; furnish and work 3-inch planks, $18 per m.

Port Arthur, Ont.

Stewart & Hewitson, of this city, have received the contract from the Canadian Pacific Railway Company for the construction of all concrete culverts and bridges to be built by the company between Port Arthur and White River during the next five years.

Prince Rupert, B.C.

The contract for the public wharf at this place has been awarded by the Provincial Government to the Westholme Lumber Company. The new wharf will be 600 feet long and 80 feet wide. The piles will be of steel reinforced with concrete. The covering will be of British Columbia fir.

Public Buildings, Churches, Schools, etc.

Arnprior, Ont.

Tenders addressed to A. Murphy, Township Clerk, Antrim, will be received until May 28th for repairing and moving Township hall. Plans and specifications on application.

Belleville, Ont.

The city will donate a site for a government boathouse.

The ratepayers will be asked to vote on a bylaw to raise $70,000 for new schools.

Fletwode. Sask.

Tenders addressed to J. C. Warner will be received until May 19th for building a new school house for Fletwode School District, No. 411.

Fort William, Ont.

A $100,000 opera house is said to be projected for the corner of May and George streets.

Galt, Ont.

Tenders addressed to John Perry, Secretary, Public School Board, will be received until May 21st for all trades in an addition to the Central school. Plans and specifications at office of Town Clerk.

Hamilton, Ont.

A committee has been appointed to deal with the proposition of erecting a new Deaconesses' Home at a cost of $10,000.

The ratepayers will be asked to vote on a bylaw to raise $30,000 for a site for a new hospital. This sum is also to provide for repairs to the present fever wards of the hospital.

Nelson, B.C.

A campaign has been inaugurated to raise funds for the erection of the proposed new hospital.

Ottawa Ont.

A new Masonic Temple will be erected on Metcalfe street at a cost of $50,000.

Fresh tenders will be taken for the grand stand at the exhibition grounds. Architect Noffke is making some changes in the plans.

Saskatoon, Sask.

Competitive plans are invited for a collegiate institute building to cost $90,000 Address W. P. Bate.

On May 17th a vote will be taken on bylaws for $25,000 to purchase a site for the Collegiate Institute.

Shellmouth, Man.

The ratepayers will vote on May 17th on a bylaw to issue $3,500 school debentures. F. G. Richardson, Secretary, Asessippi, Man.

Silver Creek, Man.

The ratepayers will vote on May 21st on a bylaw to issue $2,000 six per cent. school debentures. W. S. Chaylor, Secretary, Board of Trustees; W. McKay, clerk.

St. John, N.B.

The Victoria street Baptists have appointed a committee to prepare specifications and take tenders for the enlargement of their church. Work will be commenced about June 1st. Rev. B. H. Nobles is pastor.

St. Thomas, Ont.

The city has decided to furnish either steam or hot water heating for the locomotive engineers' building. Address City Engineer Bell.

Toronto, Ont.

Dr. Sheard, Medical Health Officer, will ask the Board of Control to build an incinerator in the north end of the city.

The Church of the Epiphany, Parkdale, contemplate the erection of a new church. Rev. B. Bryan is rector.

The Board of Education is taking fresh tenders for several trades required for the erection of the Avenue road school. (See advertisement.)

Property Commissioner Harris has recommended the erection of a new Registry Office on a site near the city hall and has asked the Property Committee to secure estimates.

Tenders addressed to E. J. Lennox, architect, 164 Bay street, will be received until May 20th for all trades in the erection of a fire-proof hospital building for the Toronto Western Hospital.

Tenders for reinforced concrete work, steel and iron work, tiling and other work required in the erection of a floor to the new engine room at the high level pumping station will be received until May 18th. John J. Ward, Vice-Chairman Board of Control.

Fire Chief Thompson has reported that four new fire halls are needed at a cost of $120,000. He suggests that they be erected as follows: One at East Toronto; one on Avenue road; one on Perth avenue, and one near the corner of Bathurst and Dupont streets.

The Property Committee of the Board of Education have decided that the tenders submitted for the new eight-roomed public school for the North Avenue road district are too high. Accordingly they will not award contracts for any part of the work. The lowest tenderer for the masonry contract was Chas. Bulley, who submitted a figure of $5,000 less than his nearest competitor. This bid, however, was subsequently withdrawn. It is now suggested that the school be built by day labor.

Welland, Ont.

The ratepayers will vote on May 17th on a bylaw to issue $10,000 4½ per cent. 20-year school debentures. George R. Boyd, Clerk.

Windsor, Ont.

It is stated that the Michigan Central Railroad Company will commence shortly the erection of a new depot, estimated to cost $75,000 to $100,000, and a new 25-stall roundhouse.

Winnipeg, Man.

The Public Parks Board have a permit for the erection of a $5,300 pavilion in Assiniboine Park.

Tenders addressed to E. M. Wood, secretary, Sanitorium Board, will be received until May 25th for the erection of a sanitorium at Ninette or Pelican Lake. Separate or bulk tenders may be submitted for the whole, including heating and plumbing. Plans and specifications may be seen at the secretary's office, Parliament Buildings, and on application to W. H. Shillinglaw, architect, Brandon.

AWARDED.

Montreal, Que.

The contract for the erection of the Montreal Technical School has been awarded to Peter Lyall & Sons, the lowest tenderers, at $387,000. Eight firms tendered, with prices ranging from $479,319 to the figure asked by Messrs. Lyall. Contracts have yet to be awarded for heating, power, ventilation, electric light plant and equipment of workshop. Plans for these will be ready in a few weeks. Architects, Archibald & Perrault.

Toronto, Ont.

The Oxley-Enos Company, 94 King street west, has been awarded a $2.680 contract for electric fixtures for the reference library, reading room and hallways in the new Carnegie library on College street.

The contract for the new Shea's Theatre to be erected at the corner of Victoria and Richmond streets, has been awarded to Fred Holmes & Son, of this city, at about $200,000.

Vancouver, B.C.

Baynes & Horie, contractors, this city, were the successful tenderers, at $50,000, for the erection of the new Grandview school to be erected at the corner of Park Drive and Ninth avenue. Architect, H. B. Watson.

Winnipeg, Man.

The Maryland Street Methodist Church have a permit for a $4,000 parsonage on Maryland street.

It is understood that the contracts for the N. T. R. station buildings on that section to the east of Winnipeg, for which tenders were recently opened, will be awarded to Mr. Vopni, an Icelandic contractor of this city. The aggregate of the tender is about $114,000.

Residences

Chatham, Ont.

Wilson, Son & Arnold will receive tenders until May 12th for the erection of a frame house on concrete foundation. Plans and specifications on application.

Edmonton, Alta.

Permits have been granted to John Hall for a $2,200 residence on Fifteenth street, and to Wm. McRoberts for a $4,000 residence on Seventh street.

Ottawa, Ont.

Recent building permits include: Thos. Dean, four brick veneered, iron clad dwellings, Spruce street, $6,000; Philip Lennon, double brick veneered house, Percy street, $2,500; Albert Cottee, double brick veneered dwelling, Bolton street, $2,500; H. Taplin and J. R. Reid, apartments, Lisgar street, $5,000; Timothy Shields, double brick veneered dwelling, Hamilton avenue, $2,500; Antoine Phillips, brick veneered dwelling, Broad street, $4,000; J. H. Hurcomb, brick dwelling, Stewart street, $4,500; W. Wiley, brick veneered dwelling, Second avenue, $2,800; Christian Rees, four brick veneered dwellings, Hawthorne avenue, $4,000; F. W. Carling, addition to stores, Sparks street, $3,500; J. S. Wilson and R. Holmes, double brick veneered house, Third avenue, $3,500; Thomas Weston, frame dwelling, Archibald street, $2,000; B. T. Carey, double brick veneered dwelling, Salisbury place, $2,300; Thomas A. Graham, double brick veneered dwelling, Hamilton avenue, $4,500; W. D. Morris, solid brick dwelling, Somerset street, $6,000.

A. H. Currie, of Currie & Livock, 104 Bank street, has purchased property on the Canal driveway for the erection of a new residence to cost $10,000.

Outremont, Que.

Joseph Attier, 62 Villeneuve street, will erect an $8,000 brick apartment building.

Toronto, Ont.

E. G. Wilson, architect, 77 Victoria street, has prepared plans for a brick parsonage to be erected on Simpson avenue, near Howland road, for Rev. W. E. Baker, 128 Victor avenue.

Architect E. G. Wilson, 77 Victoria street, will erect a two and a half storey brick residence in Avenue road district, at a cost of $5,000.

Lewis Reid, architect, has prepared plans for a pair of two storey dwellings on Follis avenue, near Euclid avenue, for Mr. Henry Carter, 716 Bloor street west. The buildings will be of brick construction, with slate roof, open plumbing, hot air heating, combination lighting and electric bells. Cost of building, $4,000.

Ewart G. Wilson, architect, has drawn plans for a brick bungalow to be erected on Wheeler avenue, for Miss Logan, at a cost of $2,500.

P. H. Finney, architect, 43 Victoria street, has prepared plans for two detached two and a half storey dwellings on Major street, near Bloor street, for Mr. George Phillips, 558 Huron street. The building will be of brick construction, and will cost $6,000. Mr. Finney has also drawn plans for a $3,000 brick residence to be erected on Hampton avenue, near Wolfrey street, for Mr. A. Tambling.

Vancouver, B.C.

W. F. Jones, architects, has prepared plans for a three storey apartment house, to contain eighteen suites.

Architect Wilkie Allan, 614 Hastings street west, has prepared plans for a sixty-four suite apartment house, to be built on Alberni street for an American company.

Edward Hobson, architect, has prepared plans for a three storey store and apartment building, to be erected at the corner of Smithe and Homer streets.

Grant & Henderson, architects, will erect a large house and garage at Kitsilano, for R. P. McLennan.

B. Russell has a permit for the erection of a $4,000 residence on Tenth avenue.

Winnipeg, Man.

A Tricky will build four residences on Polson avenue at a cost of $5,000, also two on Bannatyne avenue at a cost of $3,000.

Melvin Hooper will build a $4,000 residence on Arlington street.

A. E. Ford, Nassau street, will build a $5,500 residence.

W. W. Blair, architect, has completed plans for the erection of three apartment blocks.

The Ruthenian Greek Church will erect a parish dwelling at a cost of $5,000.

H. Galbraith, Burnell street, and J. E. Merley, Chestnut street, will each build $3,000 residences.

J. McKinnon will build a house on Rose street at a cost of $4,800.

Permits have been issued to R. R. Pattinson for two houses on Royal street to cost $8,000; to J. C. McGreevy for four houses on Fleet avenue to cost $4,000; to A. Johnston for two houses on Victor avenue to cost $5,000, and to H. Johannesson for a house on Home street to cost $3,600.

Herbert B. Rugh, architect, has completed plans for a residence to be erected on Harvard avenue, for Mr. G. S. Robertson. It will be of brick veneer, with stone trimmings, and will cost $10,000.

M. J. Schooley has been granted a permit for an apartment block on Sherbrooke street to cost $14,500. Other permits include: G. W. Ford, dwelling, corner of Proud and Balmoral place, $8,000; J. Mc Gill, dwelling, Arlington street, Preston and Buell, $2,500; W. H. Poole, dwelling, Osborne place, $2,000; Mrs. M. Bruce, house on Aubrey, between Buell and Bath, $3,000; F. Curry, house on Arlington, between Bath and Ida, $3,800; W. J. Armstrong, house on Home avenue, between Buell and Preston, $4,500; G. Anderson, house on Dorchester, between Harrow and Stafford, $5,500; Fred Topham, double house on north side of Gordon, $2,500.

West Toronto, Ont.
Recent building permits include: Wm. Ellis two and a half storey brick, Keele street south, $3,000; Eric Boon, two and a half storey solid brick, Medland street, $2,600; C. J. Boon, two two and a half storey houses, Medland street, $2,700 each; C. J. Boon, two two and a half storey solid brick, Keele street, $2,700 each; Laughton Bros., pair two storey houses, Gilmour avenue, $3,200; Henry Gaffney, six pair semi-detached two storey solid brick houses, Weston road, $2,000 a pair; Louis S. Johnston, two and a half storey house, Western avenue, $2,600; S. W. Hopper, two two and a half storey houses, Keele street south, $3,000 each; M. B. Bentley, two storey detached solid brick, Louisa street, $2,600; James M. Rosevear, two and a half storey house, detached, solid brick, $2,500; C. A. James, pair two storey semi-detached houses, Fairview avenue, $3,000; John Marr, two and a half storey house, Keele street south, $3,000; Wm. Maher, two and a half storey solid brick house, Keele street south, $3,600; Gordon Marr, pair of two storey semi-detached houses, Pacific avenue, $3,600; two two and a half storey brick houses, Quebec avenue, $2,200 each.

AWARDED.

Halifax, N.S.
The contract for the erection of Alderman N. B. Smith's new residence on Oxford street has been awarded to E. J. Horne.

Toronto, Ont.
The following contracts have been awarded for a three storey apartment building to be erected on St. George street, Toronto, for Mrs. E. D. Y. Cohen, 147 Farnham avenue: Masonry, Smallwood Bros; carpentry, Sim & Smart; roofing, Douglas Bros.; painting and glazing, Taylor & Company; plastering, Hanna & Nelson; plumbing and heating, Purdy, Mansell Company; electric wiring, Rice, Graham & Company. Cost of building, $17,000. Architects, Langley & Howland, Bay and Richmond streets.

R. J. Edwards, and Saunders, architects, 16 Toronto street, have awarded the following contracts for a two and a half storey residence to be erected on Wilson avenue, near King street: Masonry, Moore & Stewart; carpentry, Geo. H. Walters; sheet metal work, Lankin & Son; painting and glazing, Robert Morse; heating, John Ritchie Plumbing & Heating Company; plumbing, A. F. Passmore; electric wiring, H. B. Jackson. Cost of building, $5,200.

Westmount, Que.
Alex. F. Crossman, architect, 84 St. Francois Xavier street, Montreal, has awarded the following contracts for the erection of four houses for Mr. W. L. Chipchase: Excavation, masonry and brick, John Stewart & Company; carpentry, D. H. Scott & Company; plumbing and heating, John A. Gordon; painting and glazing, Chris Sonne; plastering, H. H. Fernald, roofing, Sibley & Huot; electrical work, Electric Repair & Construction Company.

Business Buildings and Industrial Plants

Alexandria, Ont.
The town is negotiating with the Bond Transmission and Foundry Company, of Manheim, Pa., for the establishment of a factory.

Algoma, Ont.
The buildings of Pyne Bros., J. David, Methodist church and others were destroyed by fire last week at a total estimated loss of $30,000.

Bracebridge, Ont.
The store of G. W. Ecclestone, hardware merchant, was badly damaged by fire last week.

Brandon, Man.
A large eastern business house is said to contemplate the erection of a departmental store on Rosser avenue. Publicity Manager Kirkcaldy has the matter in hand.

Brantford, Ont.
The American Radiator Company has purchased the premises of the Cockshutt Plow Company and is making considerable extensions.

Barnet, B.C.
The Northern Pacific Lumber Company's sawmill was destroyed by fire last week at a total estimated loss of $350,000.

Cartiers, Alta.
The Imperial Elevator Company will put up a 40,000-bushel elevator here.

Chatham, Ont.
Mayor Westman is stated to be negotiating with a firm desirous of establishing a beet sugar factory in Chatham.

Edmonton, Alta.
The Royal Fruit Company will shortly begin the erection of a two-storey warehouse on Third street. Excavations have begun, but the contract has not yet been awarded.

Fort William, Ont.
The Fort William Forwarding & Warehousing Company have purchased a site having a frontage of 1,000 feet on the river. A dock the full length of the frontage will be built and warehouses constructed. Work will probably start at an early date.

Halifax, N.S.
The premises of Frank Fraser, Hart & Sons, J. R. Farquhar & Company, and others were destroyed by fire last week. Total estimated loss, $100,000.

Kamloops, B.C.
In a disastrous bush fire which occured last week, the Carlin and Carrigan sawmills on the Salmon river were destroyed by fire. The former was valued at $75,000 and the latter at $35,000.

Montreal, Que.
A. J. Higgins, of Higgins & Cooper, lessees of the St. Lawrence Hall, is endeavoring to promote a company to erect a ten storey hotel building on Phillips Square at a cost of one million dollars.

Merritt, B.C.
A new bank building will be erected here within a few months. Address Mr. Strickland, Merritt, B.C.

Excavation has started for a large hotel to be erected by Mr. W. McIntyre, proprietor of the Coldwater hotel.

Ottawa, Ont.
The Capital Scale, Brass & Iron Foundry Company have purchased a site at the corner of Duke and Queen streets where they will erect a factory. The new building will be of cement blocks. Construction will be begun at once.

Peterborough, Ont.
The Colonial Weaving Company will at once start work upon the erection of their new factory. Plans and specifications are completed and tenders will be called immediately.

The Peterborough Canoe Company contemplate the enlargement of their factory.

Port Arthur, Ont.
The ratepayers have voted in favor of a bylaw granting certain property to the Canadian Northern for hotel purposes. Work on the hotel, which is to cost $250,000 exclusive of furnishings, will be commenced at once.

Regina, Sask.
The C. P. R. will build new freight sheds, 500 feet long.

St. Marys, Ont.
It is stated by the officials of the cement company that active operations on the new plant will be started about the end of the month. Address John Lind, manager.

Saskatoon. Sask.
Tenders closed May 8th for the erection of a new building for the Bank of Montreal. Peden & McLaren, Montreal, architects.

Sidney, B.C.
Operations will commence shortly on the construction of a sash and door factory. A. Berquist is interested.

Strathcona, Alta.
Wilson & Herrald, architects, have just taken tenders for a brick store building on Whyte avenue.

Sherbrooke, Que.
White & Foulds, architects, have prepared plans for a large four storey brick hotel to be erected at the corner of Belvidere and Victoria streets for F. J. and W. H. Southwood.

Toronto, Ont.
Mr. Sydney Small has purchased the Baldwin property, Nos. 82 and 84 King street west, now occupied by the Richelieu restaurant. The purchaser purposes expending $150,000 in the erection of a modern bath-house, to include hair dressing parlors, baths, etc.

The premises of H. A. Wilson & Company, Limited, 297 Yonge street, were damaged by fire on May 8th. Damage to building estimated at $2,500.

The premises of the Canada Glass Mantels and Tiles, Limited, Richmond street east, were damaged by fire recently.

Vancouver, B.C.
Plans have been prepared by Architect E. Stanley Mitton for a four storey hotel to be erected on Westminster avenue, be-

tween Harris and Barnard street, for the proprietors of the Sherman hotel.

W. B. Arnold, of the Dominion Trust Company, representing a syndicate of local and Toronto business men, has purchased a site on Hastings and Howe streets for the erection of a large warehouse.

Victoria, B.C.
The E. & N. Railway will erect extensive coal bunkers and wharfage accomodation in the outer harbor on the waterfront of the Indian Reserve. Construction will start immediately.

Bannerman & Horne will erect a $20,000 block at the corner of Broad and Johnson streets. Construction will be commenced as soon as plans are completed.

Winnipeg, Man.
The Public Press, Limited, have taken out a permit for a printing office on Sherbrooke. Estimated cost $2,500.

A permit has been taken out for an $8,000 addition to the Farmers' Advocate block.

J. D. Atchison, architect, Bank of Toronto Building, has just taken tenders for the erection of a fireproof office building for the Great West Life Assurance Company.

The Lewis Furniture Company has purchased the old Royal Furniture block and will make extensive alterations to same.

Architect Acheson is stated to be preparing plans for a five-storey business block on Portage avenue for Oldfield, Kirby & Gardner.

The Bank of Commerce is to be considerably enlarged. Darling & Pearson, architects, are now preparing plans.

The Dominion Express Company have obtained a permit for alterations and additions to cost $10,000.

A $10,000 storage house is to be erected on Ross avenue for the Bird's Hill Sand Company. Wallace & Aikins, contractors.

F. E. Crump will erect a $2,000 store, corner of Preston and Sherbrooke.

Wallaceburg, Ont.
The Sydenham Glass Company, recently burned out, is securing from the Pittsburg Construction Company plans for a mammoth steel structure to replace the old factory.

Westley, B.C.
The Yale Columbia Lumber Company's sawmill at Title was destroyed by fire last week.

Welland, Ont.
The Canadian Seamless Steel Company, Limited, capitalized at $250,000, is negotiating with the Humberstone Township Council with a view to erecting a plant at a cost of $125,000. The company asks a loan of $25,000 and wants to enter upon construction at once.

AWARDED.

Montreal, Que.
The general contract for the erection of a six storey store for H. A. Wilder & Company has been awarded to C. E. Deakin, general contractor, this city.

Thamesville, Ont.
The contract for the Merchants Bank has been awarded to C. & W. Hubbell. Architects, Wilson, Son & Arnold, Chatham, Ont.

Vancouver, B.C.
Architect Gardiner, Hartney Chambers, Vancouver, has awarded to Christian, Hart & Christian, the excavating contract for a six storey office building to be erected on Pender street, for Mr. D. D. Hutchinson.

Winnipeg, Man.
The Dominion Bridge Company, Limited, Winnipeg branch, have the contracts to supply all iron and steel work for the new J. D. McArthur block, the new Bank of Nova Scotia, and the Transcontinental bridge over the Red river. The total of these will be over $300,000.

Power Plants, Electricity and Telephones

Altona, Ont.
The Central Telephone Company has been incorporated with a capital of $40,000. J. Underhill is interested.

Galt, Ont.
The ratepayers will probably be again asked to vote on a by-law for hydro-electric power.

Kamloops, B.C.
Tenders addressed to J. J. Carment, City Clerk, will be received until May 18th for steam and electrical machinery. Specifications may be obtained of H. K. Dutcher, Vancouver, B.C., or from the City Clerk, Kamloops.

Moncton, N.B.
J. B. Weller, C.E., superintendent of the Welland canal, and one of the promoters of the Fundy Tidal Power Company bill, now before parliament, has outlined the scheme for the development of power from the Bay of Fundy. The proposed dam is to be constructed at Hopewell Cape and is to be 40 feet high. Surveys will be made this summer. It is hoped to have plans completed by the fall.

Montreal, Que.
The project of the electrification of the G. T. P., from Montreal to Moncton, 460 miles, seems to be under serious consideration. The power which would be utilized would be the Grand Falls on the St. John river, about half way between the two points. This, in connection with the lakes, would give 150,000 horse power.

The Canadian Pacific Railway telegraphs will construct a metallic circuit from White River to Fort William, making 502 miles of copper wire for train despatching. They will likewise string two copper wires between Winnipeg and Brandon, 133 miles; and also from Swift Current to Medicine Hat, 147 miles; from Winnipeg to Field, B. C., 971 miles, which is to be used for telegraph purposes, while a copper wire will be erected from Calgary to Cranbrook, 276 miles, this also being for commercial purposes, and making 2,500 miles of new copper wire to be put up by the company during the coming season. They are also engaged in rebuilding over 600 miles of pole lines in different parts of the system, besides which, several hundred miles of new wire will be spread over the new western provinces.

Miniota, Man.
Preparations are being made for the construction of a rural telephone system. For further information address Reeve Gerrand, Minota.

North Battleford, Sask.
The proposition to issue $75,000 in bonds, the proceeds to be used for the installation of an electric light plant, water works and sewer system, will be submitted to the ratepayers.

Willis Chipman, consulting engineer, 103 Bay street, Toronto, has been retained to prepare plans for a municipal electric lighting system.

Perth, Ont.
Three independent telephone lines will be constructed in this district during the coming summer.

Port Arthur, Ont.
The Street Railway Commisisoners have decided to call for tenders for four "pay-as-you-enter" cars. For further information address J. J. Carrick.

Quebec, Que.
It is reported that the controlling interest of the Quebec Railway, Light & Power Company has passed into the hands of a syndicate, which is desirous of extending the railway to Murray Bay, a distance of 56 miles. The railway will start from St. Joachim and will cost about $2,000,000.

Vancouver, B.C.
The bylaw has been introduced in the council of the municipality of Burnaby to grant a forty-year franchise to the British Columbia Electric Railway Company. It is proposed to construct an electric line from the east boundary of Hastings townsite through the municipality.

Tenders will be received by W. McQueen until May 20th for uspply of electric wire as follows: (1) Six miles No. 10 B. & S. gage, M. H. D. copper wire, W. P. insulation; (2) one thousand six hundred and fifty feet (1,650 feet) of six pair No. 14 B. & S. gage stranded copper, oil insulation, lead covered; (3) one thousand one hundred feet (1,100 feet) same as No. 2, six pairs with steel armoring; (4) four thousand five hundred and fifty feet (4,550 feet) four pairs No. 4 B. & S., same as No. 3. Specifications at office of City Storekeeper. Samples to be submitted to C. H. Barker, superintendent fire alarm, No. 2 firehall.

Victoria, B.C.
The council is considering the question of securing electricity from the British Columbia Electric Company to supply additional lamps for the present, instead of making extensions to the municipal plant this year as planned, which would require an expenditure of about $20,000. It is estimated that the company can provide street lamps at $38 each per year, which will save the city about $10,000 per year.

Wellandport, Ont.
The Dunnville, Wellandport & Beamsville Electric Railway Company is taking tenders for grading for its proposed electric railway, which will connect Dunnville, Wellandport and Beamsville. The company has decided to purchase electricity to operate the road. James A. Ross, of Wellandport, is treasurer.

AWARDED.

Brantford, Ont.
Mr. Wyse, formerly manager of the Brantford Electric & Operating Company, now of Toronto, has secured the sub-contract for the erection of the telephone line in connection with the Hydro-Electric installation. The contract runs into nearly $100,000.

Lachine, Que.
The panelboards for St. Ann's Convent are being furnished by the Hill Electric Switch and Manufacturing Company, Limited, Montreal. The wiring is being done by Picard & Lalonde, Montreal.

(Continued on page 41)

Tenders and For Sale Department

To Contractors

Sealed bids will be received up till noon of WEDNESDAY, MAY 19TH, 1909, for all trades required in the erection of a residence in Russell Hill Drive, Toronto. The lowest or any bid not necessarily accepted.

F. S. BAKER, Architect,
Traders Bank Building, Toronto.
19

Tenders Wanted

Tenders addressed to F. Vickert will be received up to MAY 22ND, for the building of two Cement Abutments for Steel Bridge over River Nith, Blenheim Township. Plans, specifications and full particulars can be obtained at the office of

F. VICKERT, Reeve,
Princeton, Ont.
20

Tenders

Sealed tenders addressed to the undersigned and marked "Tenders for Sewage Disposal" will be received up to noon on FRIDAY, MAY 21ST, for the building of a

Sewage Disposal Plant
for the City of St. Thomas

Plans and specifications can be seen and blank forms of tender obtained at the office of the undersigned. A marked cheque payable to the Treasurer of the City of St. Thomas for $500.00 must accompany each tender as a guarantee of good faith.

JAS. A. BELL,
City Engineer.
20

City of Moose Jaw, Sask.

Tenders For
Laying Sewer and Water Mains

Sealed tenders addressed to Alderman Matthews, Chairman, Water and Sewer Committee, City Hall, Moose Jaw, will be received in the Council Chamber, up to 8.30 p.m., MONDAY, MAY 31ST, 1909, for Labor and certain Materials in connection with laying approximately 15,000 feet of 8″ tile Sewer and 6″ C.I. Water Main, Manholes, Etc. The lowest or any tender not necessarily accepted.

Plans and Specifications can be seen in the office of the undersigned.

J. DARLINGTON WHITMORE,
City Engineer,
City Hall.
21

Water Works Plant

Peterborough, Ontario, Canada

Sealed Tenders will be received by the undersigned up to MONDAY, THE FOURTEENTH DAY OF JUNE NEXT, at noon, for the manufacture and installation in place of one and two pumping units of three millions imperial gallons each per twenty-four hours, water works pumps with turbine water wheels, etc., complete.

Specifications can be obtained at the office of W. Henderson, Superintendent, Water Commissioners, Peterborough, Ontario.

No Tender necessarily accepted.

S. R. ARMSTRONG,
Secretary, Water Commissioners,
Peterborough, Ontario, Canada.
6th May, 1909.
20

Proposals

The City of Toronto will shortly call for tenders for the laying of about 300,000 duct feet underground conduit.

For specifications, apply to the Electrical Department, City Hall.
tf

City of Moose Jaw

Saskatchewan

Tenders will be received by the City of Moose Jaw addressed to the undersigned, on MONDAY, MAY 31ST, at 8 o'clock p. m. for the

SINKING OF A TEST WELL

for Gas, Oil, or Water the Contractor to undertake to complete the well before being entitled to any portion of his contract and to provide a schedule showing the allowance he will make on his full contract price if the City call him to stop work at less than the depth agreed upon; the Contractor to provide everything necessary except the well casing now in possession of the City, which he shall take over and allow for at a price to be named in his tender. Tenders are to be accompanied by a deposit of 5 per cent. on the contract price, said deposit to be returned to the Contractor as soon as the plant has been put in operation on the ground.

Alternative tenders are required for a well 2900 feet and 3000 feet respectively, the lowest or any tender not necessarily accepted.

JOHN D. SIMPSON,
City Clerk.
Moose Jaw, April 27th, 1909.
20

Department of Militia and Defence

Notice To Contractors

Royal Military College, Kingston

New Water Supply

Sealed Tenders, marked on the envelope "Tender for Water Supply, Royal Military College, Kingston," and addressed to the Secretary of the Militia Council, Department of Militia and Defence, Ottawa, will be received until noon, MAY 15, 1909, for the installation of a new Water Supply, at the Royal Military College, Kingston.

Plans and Specifications may be seen and full information obtained at the Offices of the Commandant of the Royal Military College, Kingston, and the Director of Engineer Services, Militia Headquarters, Ottawa.

Tenders must be submitted on printed forms supplied by the Department of Militia and Defence, and each tender accompanied by an accepted cheque on a Canadian Chartered Bank for 10 per cent. of the amount thereof, payable to the order of the Minister of Militia and Defence, which amount will be forfeited if the party tendering declines to enter into a contract in accordance with the tender.

The Department does not bind itself to accept the lowest or any tender.

EUG. FISET,
Colonel.

Deputy Minister of Militia and Defence, (H. Q. 74—20—4.)
Ottawa, April 22, 1909.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department.
19

For Sale

123 Sewer Braces, also one 6″ Centrigugal Pump Box 741, CONTRACT RECORD, Toronto.
21

Tenders

Sealed tenders will be received by the Secretary-Treasurer of the Town of Yorkton until MONDAY, the 24TH DAY of MAY, 1909, for the construction of

SEWERS

as follows:

2000 feet of 12 inch, and 15000 feet of 8 inch, with all necessary appurtenances all in accordance with plans and specifications which may be seen at the offices of the Town Engineer.

R. H. LOCK,
Secretary-Treasurer,
Yorkton, Sask.

F. T. McARTHUR,
Town Engineer,
Yorkton, Sask.
19

Town of Estevan

Province of Saskatchewan

Tenders Wanted

The time for receiving tenders for Water Works System and Main Sewer has been extended to WEDNESDAY, MAY 26TH.

Plans and Specifications may be seen at the following offices:—Chief Engineer's Office, Toronto, 103 Bay Street; Chief Engineer's Branch Office, Winnipeg, Room 47, Canada Life Building; Secretary-Treasurer's Office, Estevan.

No Tender necessarily accepted.

L. A. DUNCAN, Esq.,
Secretary-Treasurer,
Estevan, Sask.

J. G. HASTINGS, Esq.,
Mayor
Estevan, Sask.

WILLIS CHIPMAN, C.E.,
Chief Engineer,
Toronto and Winnipeg.
19

Sealed Tenders

Marked "Tenders for Bridge Construction" will be received by the undersigned at Mountain P. O. Ontario, until 12 o'clock noon on SATURDAY, THE 29TH DAY OF MAY, 1909, for the construction of

Two Re-Inforced Concrete Arch Bridges and Two Re-Inforced Concrete Piers

as the case may be, over the Castor River and McCaul Creek on the Boundary Road between Mountain and Osgoode townships, opposite the west half lot 15, con. 12, Mountain, and about eight miles from Mountain Station or Osgoode Station on the C. P. Ry.

The work to be done consists of making the necessary excavation for the construction of the two Bridges above mentioned, grading approaches thereto and the construction of wing fences.

Plans, specifications, etc., may be examined and forms of tender obtained at the following places:

At the Office of the County Clerk, Cornwall, Ont.
" " " " " " Ottawa, Can.
At the residence of John McAvoy, Dawson, Ont.
" " " " Alex. Christie, Mountain, Ont.
or " " office of Magwood & Walker, Civil Engineers, Cornwall, Ont.

The lowest or any tender not necessarily accepted.

(Sgd) ALEX. CHRISTIE,
"Commissioner."
Mountain, Ont., April 22nd, 1909.
21

CITY OF TORONTO

Board of Education

Tenders Wanted

Sealed Tenders addressed to the Secretary-Treasurer of the Board, will be received until

Friday, 3 p.m., May 14th, 1909

for the several trades required for the erection of a

New School Building on Avenue Road

Plans and specifications may be seen and all information obtained at the offices of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in the said specifications and forms of tender. The lowest or any tender will not necessarily be accepted.

WM HOUSTON, Chairman of Committee.
W. C. WILKINSON, Sec.-Treas.

19

Positions Wanted or Vacant

WANTED--A good all-round tinsmith and furnace man. Apply Box 747, CONTRACT RECORD, Toronto. 19

EXPERIENCED MAN to take charge of hydrating lime factory in the West, state references. Box 748, CONTRACT RECORD, Toronto. 19

GENERAL FOREMAN for lime stone quarry in Western Canada; must have experience in dimension stone and machinery. Box 749, CONTRACT RECORD, Toronto. 19

WANTED -Granite and marble letterer; capable of taking charge of shop if required; must be first-class and temperate. Address Box 746, CONTRACT RECORD, Toronto. 19

WANTED—Good general tinsmith—must have a knowledge of hot water heating and gasfitting; steady employment; good wages; if married man I can supply furnished house. Address communications Box 745, CONTRACT RECORD, Toronto. 19

WANTED—First year School of Science man would like to hear of any vacant position whatever, construction or survey work preferred. Has also had experience as railroad clerk and timekeeper. Best character and ability. Apply Box 751, CONTRACT RECORD, Toronto. 19

ENGINEER with long and valuable experience in construction and supervision of Hydro Electrical Plants is open to engagement May 1st. Experience especially valuable to Mining Company or with Company doing a commercial business with mines. Box 735, CONTRACT RECORD, Toronto. 19

ELECTRICAL ENGINEER with 10 years' experience in all branches of the business is open to engagement May 1st with Light, Power or Traction Company as Superintendent. Capable of making complete installations and excellent references as to character and business ability. Box 734, CONTRACT RECORD, Toronto. 19

WANTED—Position as Manager or Superintendent of a small Hydro-Electric Plant; 15 years' experience. Familiar with motors, generators, line construction, inside wiring, telephones and high tension practice. Single, reliable, temperate and a hustler. Holding good position now and have done so for four years but environment not satisfactory. Apply Box 739, CONTRACT RECORD, Toronto. 19

Miscellaneous

ONE COMPLETE SET OF CONCRETE TILE MOULDS, all size, for sale cheap. Box 164, Dunville, Ont. 19

ENGINEER'S LEVEL fourteen inch, 3 screw, Dumpy level and tripod for sale, with spare glass diaphragh, in mahogany box and best solid leather sling case; made by Troughton & Simms, London; only used two months. Apply Box 750, CONTRACT RECORD, Toronto. 19

FOR SALE—Brickyard of 12 acres; first-class clay bank, sufficient for 100 years work, with full equipment for manufacture of brick and tile; sufficient wood on ground for season: all ready for work; an ideal location; excellent market for all bricks that can be made; connection with steamboat and railway lines; spur in yard. Apply to Drawer No. 1, New Liskeard, Ont. 19

Tenders Wanted

Sealed offers marked "Tender for High School, Oshawa," addressed to P. H. Punshon, Secretary, Board of Education, Oshawa, will be received up to 12 o'clock noon of FRIDAY, MAY 21, 1909, for the erection of a

New High School Building

Plans and specifications may be seen at the office of the architects, Messrs. Ellis & Connery, Manning Chambers, Toronto, or at the office of the Town Engineer, Oshawa.

The lowest or any tender not necessarily accepted. 19

To Contractors

Tenders will be received until the 20TH INST. for all trades in connection with the erection of

Fire-Proof Hospital Buildings

for the

Toronto Western Hospital, Bathurst St.

Separate or Lump Tenders will be received.

Plans, specifications and all other information can be had at my office, 164 Bay St.

E. J. LENNOX,
Architect.

19

Sale of

Surplus Plant

The undersigned being desirous to reduce their machinery and plant offer for immediate sale the following, amongst other articles, viz:—

15 ton hand power travelling crane, air compressor, electric light dynamo, drills, marble working machinery, rubbing beds, gang saws, counter sinking and moulding machines, polishing jimmey, pulleys, grinding mill, etc.

In order to effect a prompt sale a low price will be accepted. The machinery and plant may be examined at the works, No. 550 William Street, Montreal, and all information as to prices may also be obtained there.

THE FORSYTH GRANITE AND MARBLE CO.
Limited

Montreal, May 7, 1909. 19

City of Brandon

Manitoba

Sealed Tenders will be received by the City Clerk, Brandon, endorsed "Tenders for Cast Iron Water Pipe," until 12 o'clock at noon, on MONDAY, THE 17TH DAY OF MAY INST.

For the supply of about 7,500 lineal feet of

16 inch Cast Iron Water Pipe

in 12 ft. lengths, 144 lbs. to the foot, the weight to be legibly painted on each pipe and about 5 tons of Special Castings for the same.

The said pipe and Specials to be tested to 300 lbs. to the square inch.

Pipes to be delivered f. o. b. Brandon.

Each bidder is required to state on what date he can commence delivery and complete the order.

The lowest or any tender not necessarily accepted.

The bidder whose tender is accepted will be required to enter into a written contract.

R. E. SPEARMAN,
City Engineer.

Brandon, May 8, 1909.

19

Power Plants, Electricity and Telephones

(Continued from page 39)

Toronto, Ont.

The contracts have been awarded for the cables and conduits for the city's electrical distribution plant. In both cases the contract was given to the lowest tenderer. The contract for the cables goes to the British Insulated and Helsby Cables, Limited, Prescot, Eng. The prices vary from twenty cents to $1.34 per foot, according to the different sizes and voltages. From seventy-five to one hundred thousand feet of cable will be used. The contracts for the conduits will go to the American Sewer Pipe Company, of Akron, O., the price being 4 7-10 cents per foot. The single duct conduit will be used. There were no Canadian tenderers, as none of this kind of work is done by Canadian manufacturers. These contracts cover the southern portion of the city from Dufferin street to the Don and south of Queen street. Mr. K. L. Aitken is City Electrical Engineer.

Miscellaneous

Barrie, Ont.

The ratepayers will vote on May 17th on a bylaw to issue $40,000 4 ½per cent. 20-year loan debentures. E. Donnell, Town Clerk.

Calgary, Alta.

Richard Harrison, Building Inspector, states that the following buildings are going up: Six storey business block, reinforced concrete, corner Ninth avenue and First street west, cost $140,000, owned by W. R. Hull, and Messrs. Hodson & Bates, architects; five storey business block, Eighth avenue east, cost $50,000, owner A. J. Samis; three storey apartment house, First street, cost $20,000, owner Dr. Bruner; three high schools, $45,000 each; two storey business block, First street east, cost $20,000, owners, Turnbull & Giles; two storey business block, Eighth avenue west, cost $8,000, owners, McKay & Dippie; three storey warehouse, owners, Tees & Peerse, cost $35,000; three storey warehouse, Eighth avenue, cost $30,000, owner, Dr. Blow; four storey addition to Winnipeg Paint & Glass building, $35,000; three storey brick veneer hotel, Ninth avenue east, cost $20,000, owner Mr. Rodrigue.

Hamilton, Ont.

Tenders will be received until May 27th for the following debentures: $65,000 for sewers; $50,000 waterworks; $112,000 special; $125,000 permanent roadway, all at 4 per cent. payable at the end of 20 years, and $25,000 public library 4 per cent. 7-year debentures. S. H. Kent, City Clerk.

Melville, Sask.

The municipal council has passed the following bylaws: Site for fire hall and for erection of building thereon, $2,050; police barracks, $550; water supply for fire purposes, $1,500; cemetery, $400; sidewalks, crossings and street improvements, $8,000.

Montreal, Que.

The Forsyth Granite & Marble Company offer for immediate sale surplus machinery, etc., in their plant. (See advertisement.)

Owen Sound, Ont.

The ratepayers will vote on May 15th on bylaws for the following: $30,000 twenty-year 4½ per cent. for the improvement of the electric light plant, and $7,000 4½ per cent. 15-year debentures for the improvement of town hall and market; $125,000 4½ per cent. 25-year waterworks debentures, and $3,500 4½ per cent. 10-year hospital debentures. Chas. Gordon, Town Clerk.

Ottawa, Ont.

Extensive improvements will probably be made at Riverside Park.

Pembroke, Ont.

The ratepayers will vote on May 19th on a bylaw to issue $15,000 10-year 4½ per cent. loan debentures. A. J. Fortier, Town Clerk.

South Vancouver, B.C.

The municipal engineer will furnish plans and specifications for the construction of a platform and slip at the foot of the North Arm road. Tenders will be called for shortly.

Toronto, Ont.

Recent building permits include: R. C. Bustard, two detached two and a half storey brick dwellings, De Lisle street, $7,000; W. W. Hiltz, two pair semi-detached two and a half storey brick dwellings, Sparkhall, $8,000; Walter Colwell, pair semi-detached two storey and attic brick dwellings, Delaware avenue, $5,000; J. T. V. May, pair semi-detached two storey brick dwellings, Lindsay, $3,000; H. Gingras, two pair semi-detached two storey brick dwellings, Cowan avenue, $4,000; N. F. Turner, two and a half storey brick dwelling, Dearbourne avenue, $3,500; W. J. Leach, two and a half storey brick dwelling, Westminster, $4,500; E. A. Simpson, pair semi-detached two storey brick dwellings, Margueretta street, $4,000; R. Mackey, pair semi-detached two storey and attic brick dwellings, Sunnyside, $7,000; R. J. Davey, two storey brick dwelling, Shaw street, $3,000; J. Gibbons, three attached two storey and attic brick dwellings, Shanley, $7,795; Erskine Smith, three storey brick apartments, Dovercourt road, $15,000; H. I. Clarkson, two pair semi-detached two storey brick dwellings, corner Fernbank and Salem, $8,000; Bishop & Little, pair semi-detached two storey and attic brick dwellings, Havelock, street, $8,400; J. Nolan, pair semi-detached two storey brick dwellings, Curzon street, $4,200; T. J. Madill, two storey and attic brick dwelling, Heath street; Doner & Graydon, pair semi-detached, two storey brick dwellings, Sorauren avenue, $4,000; E. Mabee, two detached two and a half storey brick dwellings, Marmaduke, $6,000; W. Pennock, two and a half storey brick dwelling, Palmerston Boulevard, $4,500; H. I. Clarkson, three pair semi-detached two storey semi-detached two storey brick dwellings, Christie street, $12,000; E. T. Reed, two and a half storey brick dwelling, Pearson, $4,000; F. L. Beecroft, two pair semi-detached two storey and attic brick dwellings, Jarvis street, $10,000; McKinney & Johnston, three attached three storey brick stores and dwellings, College street, $12,000; H. Staines, pair semi-detached two storey brick stores and dwelings, Dundas street, $4,700; Mrs. T. Harman, pair semi-detached two storey brick stores and dwellings, Dupont street, $5,000; W. R. Hoare, three storey brick store and dwelling, corner Roncesvalles and Howard Park avenue, $9,500; W. J. Craig, five storey brick warehouse, Victoria street, $35,000; J. H. Kent, two and a half storey brick dwelling, Huron street, $3,500; J. M. Walker, pair semi-detached two storey brick dwellings, Sunnyside, $5,000; Albert Maas & Kenneth Stevenson, three attached two storey brick dwellings, Spadina avenue, $12,000; Maas & Stevenson, pair semi-detached two storey roughcast dwellings, brick fronts, Fenwick, $3,200; Davenport & Moses, pair semi-detached two and a half storey brick dwelilngs, Lucas, $4,600; A. A. Lind, pair semi-detached two storey brick dwellings, Boustead avenue, $6,000; E. Vineberg, pair semi-detached two storey and attic brick dwellings, University avenue, $8,000; E. J. Jackson, three storey brick apartments and stores, Bloor street, $9,000; B. H. Fraser, four pair semi-detached two storey roughcast dwellings, Frizell, $8,000; J. H. Galloway, pair semi-detached two and a half storey brick dwellings, Wright avenue, $5,000; J. M. Hedley, two and a half storey brick dwelling, Warren road, $6,000; Bank of Montreal, two storey brick, stone and terra cotta bank, corner Queen and Yonge streets, $45,000; M. A. Hunter, pair semi detached three storey brick stores and dwellings, Dundas street, $6,000; C. D. McGee, three attached two storey brick stores and dwellings, Queen street, $8,000; F. Francis, two pair semi-detached two storey brick dwellings, Gladstone avenue, $8,000; L. E. Price, pair semi-detached two storey brick dwellings, Dovercourt road, $4,000; J. H. Simpson, three storey brick and stone store, corner College and Gladstone avenue, $4,500; Caleb Evans, two storey brick dwelling, Palmerston Boulevard, $5,000.

Winnipeg, Man.

Tenders will be received until May 15th for the purchase of the following debentures: $200,000, Province of Manitoba; $50,000, Western Judicial District, Province of Manitoba; and $12,000, Northern Judicial District, Province of Manitoba. These all bear 4 per cent. interest payable in 40 years, interest payable half-yearly. Hugh Armstrong, Provincial Treasurer.

AWARDED.

Berlin, Ont.

The Light Commission recently opened tenders for wrought and cast iron pipe for new gas mains and extensions. Seven tenders were received for 4-inch pipe, and that of P. Hymmen & Company, of Berlin, was the lowest at $27.24 2-5 per lineal foot, net, 30 days. The tenders ran up to $28.25 per 100 feet. There were three tenders for the six-inch cast iron pipe, and the lowest was $48 per 100 feet, net, 30 days. The highest tender was $50.25. The successful tenderer was the Gartshore Thompson Company, of Hamilton.

Estevan, Sask.

Debentures amounting to $50,000, issued for construction of water works system, trunk sewer, fire protection and building of new town hall, have been awarded to Nay & James, of Regina.

St. John, N.B.

The Board of Works have accepted the following tendersf or supplies: — Carrite, Patterson Manufacturing Company, 625 barrels of gas house coal tar at $3.60; 275 barrels of Trinidad asphalt at $5. Robert Reford & Company, tar at $3.80; asphalt at $4.65. A. M. Rowan, tar at $3.50; asphalt at $24 a ton of 5 1-3 barrels. The tenders of Mr. Rowan, being the lowest, were accepted. The following tenders for 55 cords of hardwood were received: H. W. Woods, at $5.95; J. J. Whelley, at $7.20; Francis Kerr & Company, Limited, at $8.50. It was decided to accept Mr. Wood's tender if he proposed to deliver a six-foot cord. Tenders for block paving were received as follows: H. W. Woods, 8,000 square yards at 53 cents; F. E. Sayre & Company, 2,000 yards at 55 cents; Randolph & Baker, 6,000 yards at 60 cents. F. E. Sayre & Company's tender for 2,000 yards, and Mr. Woods' tender for 6,000 yards, were finally accepted.

New Companies

Canadian Mineral Rubber & Paving Company, Limited, Toronto, incorporated, capital, $500,000. Incorporators, J. S. Lovell. W. Bain, R. Gowans, H. Chambers, R. M Coates, S. G. Crowell and G. H. Cassels, all of Toronto.

Poitars Woollen Mills Company, Limited. Joliette, Que., incorporated, capital $45,000. Incorporators, J. C. Lamothe, C. Champour and J. L. Duplessis, all of Montreal.

National Breweries, Limited, Montreal. Que., incorporated, capital $10,000,000. Incorporators, A. W. Buchanan, L. MacFarlane, A. E. Buchanan, A. W. Moffat and P. E. Kinnisten, all of Montreal.

Canadian Leonard Construction Company, Limited, Toronto, Ont., incorporated. capital $40,000. Incorporators, J. S. Lovell, W. Bain, R. Gowans and others, all of Toronto.

La Raquette Water Works, Limited, Rigaud, Que., incorporated, capital $45,000. Incorporators, J. H. Redpath, J. J. Riley. A. D. McDonald, F. G. Bush and L. R. Soulier, all of Montreal.

La Compagnie Trans-St.-Laurent, Limited, Fraserville, Que., incorporated to navigate the St. Lawrence river and other waters, with power to erect warehouses, wharves, etc., capital $50,000. Incorporators, M. Fraser, J. Viel, J. C. Pouliot, F. E. Gilbert and others, all of Fraserville.

Kingsville Electric Light Company, Limited, Kingsville, Ont., incorporated, capital, $20,000. Incorporators, R. S. Stewart, M. B. Stewart, G. Lothrop and J. V. Oxtoby, all of Detroit, Mich., and G. B. Hayes of Leamington, Ont.

Builders' Supply Company, Limited, St. Catharines, Ont., incorporated, capital $40,000. Incorporators, M. J. Murphy, H. H. Wilson, J. M. Farrell and F. W. Wilsen. all of St. Catharines.

Canadian Sheet Steel Corporation, Limited, Morrisburg, Ont., incorporated, capital $750,000. Incorporators, A. White, R. Kelly, J. F. Hollis, T. H. Wilson, A. Heron and others, all of Toronto, Ont.

Fountain Falls Electric Company, Limited, Toronto, Ont., incorporated, capital $1,000,000. Incorporators, W. S. Morlock, A. V. Wood, C. W. Livingston and A. D. Crooks, all of Toronto.

Northumberland Pulp Company, Limited. Campbellford, Ont., incorporated, capital $100,000. Incorporators, I. S. Fairty, E. W. Wright, H. T. Hunter, E. P. Seon and J. M. MacDonnell, all of Toronto.

Central Telephone Company, Limited. Altone, Ont., incorporated, capital $40,000. Incorporators, J. Underhill, W. J. Monkhouse, both of Pickering Township; N. Baker, of Uxbridge; N. Stouffer, of Whitchurch Township, and others.

The capital stock of the Warren Bituminous Paving Company of Ontario, Limited, has been increased by letters patent from $150,000 to $200,000.

The capital stock of the M. Brennen & Sons Manufacturing Company of Hamilton. Limited, has been increased by letters patent from $100,000 to $150,000.

Recent British Columbia incorporations include: Abbotsford Timber & Trading Company, capital $300,000; Bar Harbor Lumber & Brokerage Company, capital $10,000; Johnson-Shaw Lumber Company. capital $6,000; Mahahr Sand & Gravel Company, capital $25,000; Pitt River Lumber Company, capital $50,000; Western Engineering Company, capital $10,000; Westminster Elevator Company, capital $250,000.

The Applications of Vitrified Salt Glazed Pipe

Wonderful strides have been made in the past few years in the study and prevention of contagious diseases. In almost every case where a community has experienced an epidemic, the origin of the disease can be traced to an impure water supply.

Perhaps the greatest danger to public health lies in the contamination of water supplies of municipalities through poorly constructed sewers and improper sewage disposal.

One essential in the design of a sewerage system is the selection of a material that will render the system sanitary. Sewer pipe should be of imperishable material, strong and tough so as to resist fracture, shocks and destruction, atmospheric and chemical influences. In the latter regard, the American Sewer Pipe Company, of Pittsburg, Pa., write us as follows:

"Vitrified clay is among the most durable materials known, and its merits have been recognized for the past 2,000 years. Being economical in material, strong in texture and smooth in surface, resisting chemical decomposition, vitrified pipe meets every requisite of a sanitary sewerage system.

"Many substitutes for clay pipe have been offered from time to time, chief among them being cement pipe. This pipe is made in moulds. The cement is mixed wet and poured into the moulds and allowed to set, when the moulds are removed and the pipe is ready for use, but owing to the presence of acids in sewage, this style of pipe has not gained much favor and is very little used. The acids in the sewage attack the cement, disintegrating the pipe in a very short time, and rendering it unfit as a carrier.

"Not only for sewerage purposes is vitrified salt glazed pipe used, but waterworks engineers are specifying it for low pressure water lines, it having the advantage over iron pipe in first cost, maintenance, and percentage of efficiency. Iron pipe has a tendency to corrode and tuberculate, and where a high sulphur water is carried, they have been known to clog up, practically closing the opening in the pipe, reducing its carrying capacity 50 and 60 per cent. This feature is entirely absent where vitrified pipe is used as they do not corrode or tuberculate, and the carrying capacity remains constant at all times. Vitrified salt glazed pipe can be used with safety in low pressure lines up to 25 pounds per square inch.

"A number of large water lines have been laid recently with this kind of pipe. A few of the more important ones are: Amsterdam, N.Y., 1890, 11 miles of 20-inch clay pipe, laid to a hydraulic grade line to deliver 5,000,000 gallons per day. A recent test shows no decrease in delivery. Hartford, Conn., in 1890, 3 miles of 24-inch clay pipe, laid and is delivering more water at the present time than it was calculated to carry at the time it was planned. Findlay, O., Oil City, Pa., and Guelph, Ont., are other large lines more recently constructed."

To secure pure water at Guelph, it was found necessary to collect the water from a number of springs in the vicinity of Arkell, some five miles distant, and pipe it to a collecting reservoir at Guelph, where it could be pumped into a huge standpipe and from there be distributed throughout the city by gravity. The line was constructed of 24-inch diameter vitrified salt glazed pipe and is calculated to run two-thirds full when all the springs are connected. The flow of water from the springs is regular and will show no diminution in volume at any season of the year. The pipe was furnished by the American Sewer Pipe Company, Pittsburg, Pa.

This company controls 36 factories in five States of the Union, and supplies 50 per cent. of all the vitrified pipe used in the East. A recent order was for 140 cars of pipe, sizes 24-inch and under, from Calgary, Alta., to be used in the installation of the new sewerage system for that city.

A New Instantaneous Water Heater

An improved automatic instantaneous water heating apparatus has been produced by the Beler Water Heater Company, 311 Water street, Pittsburg, Pa., in which they claim that practically all the objectionable features of the older types of heaters have been avoided. The invention is known as the "Beler" and is manufactured and sold exclusively by the company and its authorized agents, the leading plumbing and sanitary supply houses throughout the country.

Chief among the advantages possessed by the "Beler" water heater is its automatic water pressure gas regulator, which does away with the troublesome old-fashioned plunger and its tendency to bind and wear, with springs corroding in the water chamber, and with stuffing boxes that sooner or later are bound to leak. The "Beler" regulator consists of a series of hollow, inter-communicating discs connected with the water supply at one end, while at the other extremity is a rod acting directly upon the valve that controls the gas supply. So long as no water is being drawn through the heater the pressure from the supply pipe acts upon the water in the discs and keeps them expanded so as to thrust the valve rod forward and shut off the supply of gas; as soon as any faucet in the system is opened this pressure is diminished, the discs draw together, the valve rod follows and the valve itself is opened to admit whatever supply of gas may be required to instantly heat the water passing through the coils. When the faucet is closed again the natural pressure of the water acts instantly upon the discs and valve and, of course, causes the flow of gas to be shut off.

Next to the pressure regulator one of the valuable features of the "Beler" water heater is its hydro-carbon burner, a non-corrosive burner, which they claim yields a higher percentage of heat for the fuel consumed than is given by any other form of burner. These heaters can be adjusted to bring the water to any desired temperature and automatically prevent over-heating or the production of steam in the water coils. The apparatus is constructed throughout of the best materials and is designed to furnish a liberal supply of hot water, not only instantaneously and without fail, but cheaply and with absolute safety and efficiency.

The heaters are enclosed in handsome cast iron jackets and the interior can be reached for inspection, cleaning, etc., by means of double doors which constitute half of the front of both the coil chamber and the base where the burners and pilot light are located. The whole front of the apparatus must be opened before the pilot burner can be ignited, consequently explosions of accumulated gas in the heater are prevented.

There are "Beler" single coil storage tank heaters for use with natural gas, and "Beler" double coil storage tank heaters for either natural or manufactured gas; this latter is made expressly for 30 to 60 gallon boilers and is one of the best and most economical appliances of the sort on the market.

Descriptive books and circulars relating to these new water heaters may be had by anyone who will address a request for them to the Beler Water Heater Company, at 311 Water street, Pittsburg, Po. Correspondence relating to agencies and the right to sell the improved heaters, of course, should be addressed to the same office.

The Verandah—Its Design and Construction

To Be Considered as an Integral Part of the House, not as an Adjunct—By R. C. Kennard, Architect, Toronto

There is no doubt that the verandah as we know it to-day is of a comparatively recent origin. It is to the old homesteads of Colonial days that one must turn to discover the elements of the verandah as used at the present time Certain it is that in Europe it is comparatively rare, and then is only to be found on houses of a recent date. Even in tropical Africa it was never known, or, at least, never used until its introduction by the European of recent years. True it is that the "stoep" of the old Dutch houses of the Cape, bears a great similarity, but the timber verandah, as we know it, in all probability originated in the Colonial homes on this side of the water. The design and development of this essential feature of the house has advanced with the times; so much so, in fact, that the majority of the designers of days gone by would receive a violent shock could they but see many of the distorted specimens of verandahs, as conceived by the present-day individual. In looking at a verandah of a purely Colonial type two things are particularly noticeable, viz.: its spaciousness and its simple outline and detain. There is no doubt that the majority of verandahs to be seen to-day have every qualication under the sun, save that of the two just quoted. Particularly so is it observable in houses built a generation or so back. Cramped, pokey, filled with ridiculous and unnecessary ornament, they serve to remind us of just what a verandah should not be. Even the most casual observer cannot but have observed the innumerable forms and styles that are everywhere to be seen. Oriental, Gothic, Classic, Chinese, in fact styles too numerous to mention or be defined have been attempted, and have almost invariably ended in disastrous failures, simply because, as I said before, the essential features of the design have never been observed.

Another important feature to remember is that the verandah should form a part of, and not an adjunct to, the design as a whole. Time after time this rule is never observed, the consequence being, as may naturally be expected, that it presents that "stuck on" appearance, as though it was originally forgotten and hurriedly clapped on as an afterthought. The verandah and the remainder of the house should be built up and designed "ensemble," the whole forming a uniform design, so that even a small portion being removed it would be immediately missed and the design as a whole marred. To place a verandah of an Oriental type with a house showing distinct features of European origin, is at variance with the elementary laws of design, and can only end in failure. I have often thought in looking at these elaborated speciments of verandahs that whilst pretentiousness, and I might say formidableness, are particularly apparent, the inviting homelike features so necessary to a home are conspicuous by their absence.

Having thus criticized the design a few words on the situation, height, etc., of the verandah would not be out of place. Its position, when possible, should be on the south side of the house, as that is the side that is warmest and generally the most cheerful in appearance. A good deal, however, depends upon the aspect, the owner frequently desiring the verandah placed in that position which gives him the best outlook on the scenery around. Particular attention should be paid to the height of the verandah. Many are built too high, affording little or no protection from the sun's rays. Others, again, are too low, so that the rooms that obtain their light from the verandah side of the house are darkened. Its height, too, from the ground should be carefully studied. Many are built at an absurd height from the ground level and without any protective railing between the posts. The steps, when possible, should be broad and low. Only those that have experienced it will realize the uncomfortable feeling of climbing some half-dozen narrow and high verandah steps covered with ice. A little treillage designed in keeping with the verandah and placed at the sides and along which vines, etc., can be trained often produces a very agreeable effect.

The verandah being originally a timber structure, that material should be used in the majority of cases. However, in the case of a house being designed in stone, wood would probably present too feeble an appearance and stone for the piers would probably be more suitable. As I said before, the verandah and house should harmonize in every respect, in material as well as design and detail. I have endeavored to illustrate my ideas in the sketches given. Nothing new or novel has been attempted, but rather to present the verandah designed on traditional lines, and yet suitable for the modern house. In conclusion, there is no doubt that the more we study and examine the verandahs as designed and originated in the old Colonial days, with their simplicity, beauty of detail, and proportion, the more convinced we ever become that the better it will be for comfort and utility, as well as for the success of the design, if we take them as our guide and adapt their ideas to suit the requirements of life.

"Kilindo" Wire Rope

The Dominion Wire Rope Company, Limited, Montreal, have issued an attractive catalogue relating to their "Kilindo" wire rope, and to a number of other specialties which they manufacture. This company continually seeks to meet the requirements of the most particular customers. The new "Kilindo" cable has been thoroughly tested and proved to give splendid service. Its chief feature is that it is free from any tendency to rotate, with or without load, and is constructed throughout of entirely round wires, thereby providing a smooth surface and the largest possible wearing surface. It is manufactured of eighteen strands in place of six, and is consequently of greater strength and flexibility than those with a lesser number of strands. The rope can be supplied in either Lang Lay or Ordinary Lay. Those who are interested in wire ropes of any kind will do well to write for a copy of this catalogue.

The new bridge at Revelstoke, B.C., will soon be started. There was a great deal of preliminary work to be done, but this is nearly at an end. The bridge will certainly be finished this season, according to the report of the directors.

London's building permits average 25 weekly.

Tracing the Direct Results of Advertising

Persistent Advertisers Admit that it is the Greatest Factor in Building up a Successful Business*

The subject under discussion is one that I would give a good deal of money to hear discussed by manufacturers, among themselves, when they were certain that the door was locked and that there were three anterooms and a complete vacuum between them and any publisher.

I assume, from experience with our own publications, that the people who are advertising there do so from some business reason; very few of them know me personally, and the days when people were asked to, or offered to "support" papers have gone by. More than half the advertisers in our three publications who were there twenty years ago are still there. Almost, without exception, these persistent advertisers have gradually increased their space and their expenditures—and their businesses and their shops and their bank accounts have grown in proportion.

Not long ago one of the trade publications received a letter from a man in Newark, N.J., who desired to insert an advertisement. This man, many years ago, invented and put on the market, as a side line, a little gear calculating device that sold for 50 cents. He is not a business man, but listen to his testimony as to the longevity of advertising and to its effectiveness for such a device. He says:

"If you can conveniently refer to your fyles of November 14, 1889 (20 years ago) you will find on page 4 a description of the Hawkins Gear Calculator. This is the only advertising the calculator has ever had, but the returns have netted about $700."

This means that he made about 1,400 sales covering 20 years from a single advertisement.

I take it that you gentleman want a little evidence that advertising pays when you do not see the direct returns. I would call your attention to such cases as that of James L. Robertson & Sons, who established a large engineering supply house absolutely and entirely on advertising—without the use of a salesman—just ink.

Two years ago no one had ever heard of the Industrial Oxygen Company. They commenced advertising in small spaces in one of the technical papers. They have steadily increased their output and increased their advertising, and they now write that they are getting inquiries from Java, Norway, South Africa, New Zealand and other corners of the earth, showing distributions.

I would call your attention to the Peerless Rubber Manufacturing Company, who owned a little factory at New Durham, N.J. They were struggling along from hand to mouth, as were forty competitors making packing. Because he seemed to him to be a hustler, the man with the money in this institution employed a manager, the late Charles H. Dale (then a conductor on the West Shore Railroal). Mr. Dale commenced an aggressive campaign of advertising, using the largest part of his appropriation in one paper reaching engineers, to whom their product was particularly desirable, and kept it up for 20 years. He brought this little factory from one of the smallest to become one of the largest in the world, putting it and himself at the head of the rubber business, where he received a salary of $100,000 a year, and he did it with ink.

I would call your attention to the way some people make a great mistake in supposing that everybody knows them, and they are established beyond all peradventure as the people in any one branch.

A few years ago none of you, and very few mining men, had heard of the Jeanesville Iron Works, of Jeanesville, Pa., as pump builders. They had a local reputation in the anthracite field. Almost entirely by advertising they have become the largest and principal builders of steam pumps for mining purposes ,passing their competitors—and passing them with ink—the other great builders failing to see the straight road, and assuming that there was no use in wasting their money on advertising. Now, when a mining man thinks of big pumps, he can't help thinking of Jeanesville first.

I would call your attention to the case of Wm. J. Smith, of New Haven, who invented and put on the market an expanding reamer only two years ago. In competition with 25 others, long on the market—some advertised and some not—by forceful and persistent advertising, the Smith concern has built up a business at home and abroad to be proud of—on one little device selling for $4 or $5.

I would call your attention to the case of the Minneapolis Steel & Machinery Company. There are more kinds of Hyphen-Corliss engines built in the United States to-day than you can count on your fingers and toes twice over. This concern commenced to build very large sizes of Corliss engines and to advertise them in the engineering papers. As an evidence that they must think this pays, they have gradually increased their advertising, and when "Power" was made a weekly, they were among the first to take a page in each issue—weekly—for five years. Not for fun—for business.

A number of years ago a prominent maker of large machine tools, selling for $2,000 or $3,000 each, placed an advertisement in one paper that I know of, with the remark that "we never could tell whether advertising paid or not." In the course of the running of this advertisement they described and illustrated a very large machine on the front page of the publication. In less than two months after it appeared, Adolf Jansens, a machinery dealer of Paris, was in my office and remarked that the moment he saw that picture, he cabled for one of the machines for the great Crusot Works, the gun makers of France. It arrived promptly, and he sold two duplicates of it to the same concern. Did the advertiser pat the advertising medium on the back? Not any. When it came to the renewal time the representative asked if they had had satisfactory returns, and was met with the answer that it was difficult to say—nothing traceable. When pinned down with the facts, the advertiser laughingly said that "if we told you fellows that you would raise the rates."

I want to say right here that there is mightly little encouragement and less co-operation from advertisers and their advertising managers that put heart and life into the publishers of trade papers. They never tell them when they do well, they always declare they do badly.

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*Paper read by John A. Hill before the Technical Publicity Association.

Now, it is human for a buyer to always be a "bear," but is this a case of buying and selling only? Will the advertiser never come to the realization of the fact that the reader hires the troupe and the advertiser gets the leader to sing a song with his name in it!

Will the advertiser never come to realize that the publishing of an engineering paper is based upon readers who buy, and that he is the man who finances the show, and gets his money back, or he would not finance it for long.

Will the advertiser never realize that it is perhaps at least poor business to assume that every publisher is a weak-kneed easy mark, because some of them are? Will he never distinguish the difference in quality of papers as he does the difference in quality of the machinery that he buys?

While talking of big things, I might mention that recently Mr. Traylor, of the Traylor Engineering Company, told me accidentally that he had received an order from Italy for a complete smelter, due solely to one of his advertisements in a mining publication, having never heard of the people before.

Returns that Come Through Agents.

As to the indirect and tangible returns, the Philip Carey Manufacturing Company, makers of pipe covering, are large advertisers. They do not expect to get direct returns, but their agents get direct returns, and their agents insist on their goods being advertised.

Perhaps one of the best advertised men in any of our papers is Charles Churchill, of England, agent for American machine tools. No machine tool firm who is represented by Churchill ever left Churchill's name out of their ad., that they did not get a letter from Churchill with a very large kick, and some very good reason why he thought his name and address should be there. Do not credit it all to the agency when Charles Churchill & Company make you a good sale.

On the dedication of their new ten-storey building in New York, Mr. Charles A. Schieren, Jr., used the following words in his speech:

"We attribute the magnitude of our business in our fortieth year in large measure to persistent advertising. We have used a large amount of space and conspicuous positions in a few engineering publications, and have always been careful to make our advertising striking and it has always paid."

Prentice Bros. Company, of Worcester, Mass., builders of large machine tools, recently received an order for one of their large machine tools abroad, with a picture and description of this machine in a full page advertisement torn from a machinery paper. This firm they did not know, but the firm knew them well enough to know that they were straightforward business men, or they would not be doing big advertising regularly, and they ordered without knowing the prices.

As an evidence that some people are converted on some points after a while, would say that a short time ago we received a letter from the American Tool Works, in which they said:

"We believe it is about time to remove the 'key' in our ad., namely, 'Catalogue G' and '100-150 Culvert street,' as your paper is so well established that we do not see any need of continuing the 'keys,' which was an experiment, and has proven satisfactory, so kindly eliminate them."

I would call your attention to the case of the Niles-Bement Pond Company, the largest machine tool builders in the world. Six years ago their separate works were using from an eighth to a half page each. Five years ago they gave a machinery paper an order for six pages weekly for five years, and everybody thought it was great advertising. Within the last month that concern has closed another five-year contract for sixteen pages every week in the same paper. What for? To support the paper? No! For more business.

A Proof that Ads. Are Read.

Perhaps one of the things that makes advertisers agnostics and discourages the thoughtless publishers, is the evidence coming to them from time to time, very often rubbed in and salted by the advertising manager, that the advertisements are not read. But every publishing house is flowing over with evidence that they are read. Make a serious mistake in some statement in an advertisement, and see how quick you hear from it. Turn it upside down, as the Henry & Wright Manufacturing Company did (and trebled their inquiries) and you will get letters, perhaps like lots of their, because the readers thought the printer had made a mistake—but evidence all the same that the advertisements are read, this being but a quarter-page in the back of the paper.

If any paper could insure the reading of every advertisement by all its subscribers, it would be something like a machinery house that could be assured that it would have a refusal of every order at its own price before it was offered elsewhere. Salesmen make useless and fruitless calls just as well as trade papers. Thousands of good letters go to deaf, dumb and blind possible buyers.

I do not believe that advertising is a panacea for all business troubles, but I do believe that advertising will perform a large part of the selling work, and do it much cheaper than it can be done in any other way.

I do not condemn circulars, catalogues, form letters or bulletin boards on the meadows. Any one of them may be a live seed falling on fertile ground. But I have convincing evidence, to myself, that the fertile ground of the circular is often the dust in the bottom of the waste paper basket.

On a recent trip to England, five of our large advertisers had not seen and could not find the recent circulars and map about our circulation, which we had sent out, and one of these had asked for it, and every house had received a copy.

I pin my faith to the advertising in specialized papers that a man buys to inform himself about his business.

Good Copy the Great Essential.

Copy is the life of every advertisement. It is the seed of success. Certainly, as much attention should be paid to copy as to space. But address it to the man's live spot—his business interests.

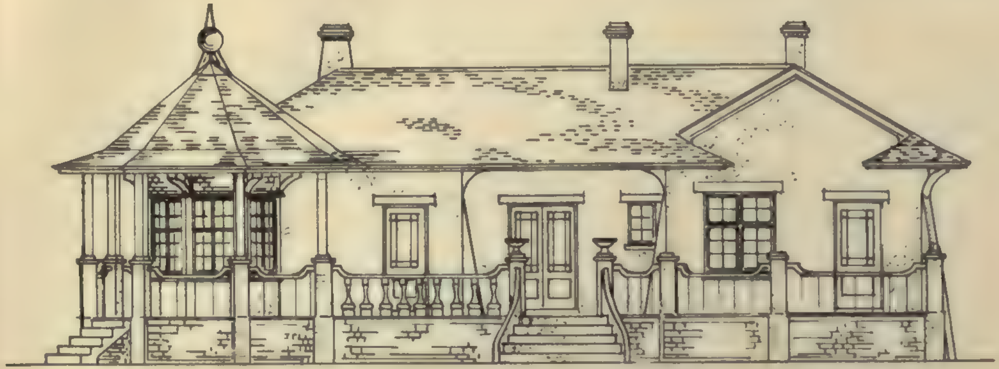
If advertisers would work their ingenious brains as persistently over good copy—copy with reasons in it—copy with arguments in it—copy that convinces—as they do to get a write-up in the papers, there would be "something doing."

I believe that most of you begin to realize that co-operation with the publisher and with the men who pay for his paper, and pay for your advertisement to be in his paper, will pay you better than any other method.

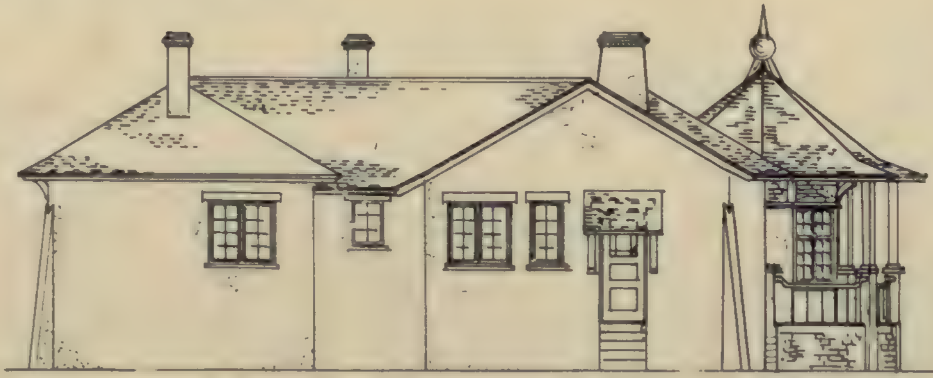
The advertiser and the publisher are not two sharpers trying to see who can get the better of each other, but two business men, who are trying to make a trade that is mutually satisfactory and profitable. No publisher can win until after his advertisers have won. No advertiser ever won until the readers acknowledged by their orders that the whole transaction was profitable to them, for after all—

The reader—he pays the freight

A Concrete Bungalow for Suburban Site



—FRONT ELEVATION.—



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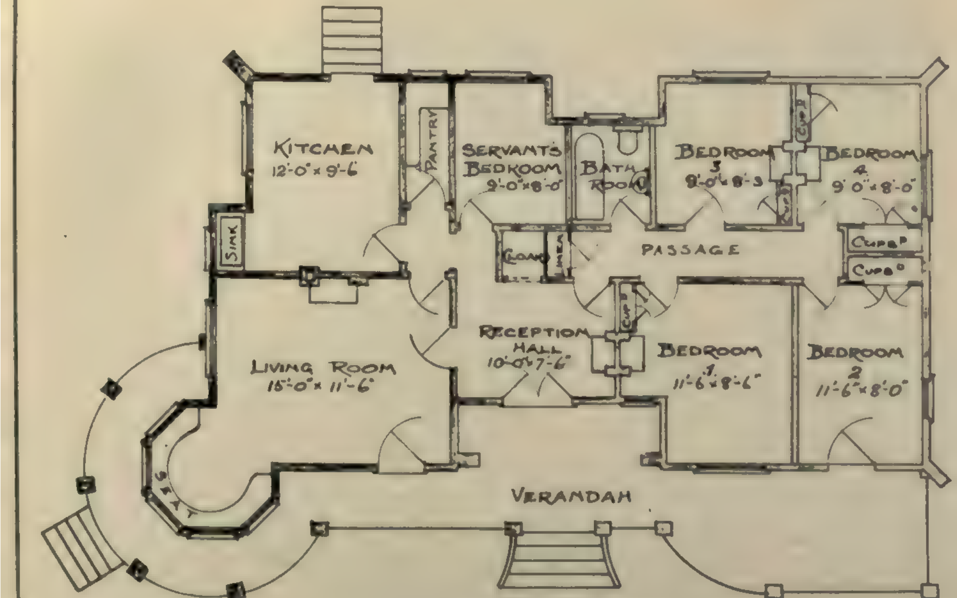
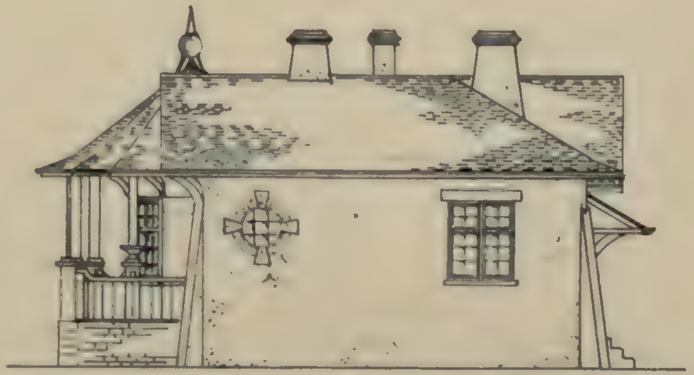


—PLAN—



—SIDE ELEVATION—

H. Bryan Gilbert
ARCHITECT
7 STANDARD EXCHANGE B^LDG
TORONTO 1909.

A Concrete Bungalow for Suburban Site

Designs and Description of an Inexpensive Country Home—By H. Bryan Gilbert, Architect

The use of cement in the construction of buildings is receiving more attention every year, and it behooves architects and contractors to study the value of cement more than has been done in the past. Many condemn concrete as not being so pleasing to the eye as ordinary brick, on account of its color, so that it becomes necessary for architects to seek a method whereby this difficulty can be overcome without taking away the strength of the material and its advantages over brick.

The accompanying sketch of a bungalow illustrates a pleasing example of monolithic concrete construction. The concrete to be used should consist of one part of Portland cement, two parts of clean sharp sand, well graded from coarse to fine, the coarser particles not being larger than will pass every way through a ¼-inch screen and slightly predominating over the finer ones, and five parts of broken stone cubes of about 1½-inch in size. The concrete should be placed and well tramped immediately after mixing and before the initial set has taken place, in layers 6-inch deep, and carried up as evenly as practicable round the building, in forms set to make the walls 6-inch thick, small strips bedded horizontally on the outside face of the wall and removed when the form work is taken away, will give a key to the stucco or finishing coat. The formwork should not be removed until ten days after the top layer has been placed.

Particular care should be exercised in measuring and mixing the proper proportions of ingredients for the finishing coat, as this coat by reason of its position should be water-proof, white in color, and of a dense surface. As a white effect is desired, white cement should be used, mixed with white fine-grained sharp sand. If such sand is not obtainable, finely crushed white limestone can be substituted, with a small portion of white marble dust, in about the proportion of two parts of marble dust to four parts of sand and one part of cement. These ingredients should be mixed with clear water to a stiff and add adds to the "bungalow" effect, the external paste and plastered on the concrete in about a ¾-inch layer and trowelled smooth.

The deep overhanging eaves give plenty of shadow and add to the "bungalow" effect. The external woodwork, except that of the doors and windows, will be left from the saw and treated with a dark creosote wood preserver, the woodwork of the doors and windows being painted a darke sage green with white sash bars.

The roof wil be double boarded with rough lumber with a 2-inch cavity between, this cavity forming an air space which will assist in keeping back the heat from the rooms in summer weather. Owing to the flat pitch given to the roof the rain will not readily run off the shingles, so that a layer of patent felt roofing has been provided between the layers of boarding, which will catch and throw off any moisture soaking through the shingles.

The verandah floor has been designed in wood, as concrete retains the heat too much for flooring purposes in the hot weather; the steps, piers, balusters, rail and flower vases are proposed to be of concrete, the rail being reinforced with iron rods, the walling under the verandah floor being of white limestone in rubble courses.

On entering the bungalow one comes into a square hall 10 feet by 7 feet 6 inches, with a fireplace and cloak closet, the floor veing paved with stone slabs. The living room is of convenient dimensions, 15 feet by 11 feet 6 inches, and the bay window enables one to obtain a pleasant view of the surrounding country.

The servant's bedroom has been placed in close proximity to the kitchen, and by closing the door on the right hand side of the hall the family's bedrooms are shut off from the remainder of the rooms, thus ensuring privacy. The bathroom and linen closet have been placed near the bedrooms, and the plan commends itself as being compact and in every way suitable for a priviate summer residence.

The bungalow requires approximately 51 cubic yards of concrete and contains 25,200 cubic feet, and should be erected for 12 cents per cubic foot, but this figure would vary according to the circumstances under which the building was erected.

Much Construction Work in Vancouver

Nearly two million and a half dollars' worth of steel construction buildings are going up at present in Vancouver, indicating the substantial character of the city's progress. Those on which work is proceeding are: The Winch Building, adjoining the new post office, $380,000; Bauer & Harrison, hotel, immediately opposite, $200,000; new post office, $450,000; Mercantile Building, $180,000; Arcade structure, $500,000; Carter-Cotton Building, $225,000; Exchange Building, $75,000; Crowe & Wilson Building, $50,000; P. Burns & Company, building, $25,000; B. C. Electric Railway Company's new offices, $250,000. This does not take in the new court house, which will involve an expenditure of half a million, as it is located three or four blocks from the others, which are included in the strict down town area. The court house building is of stone and iron, and is now up to the second story.

The Newfoundland Customs returns for the fiscal year ending June 30th, 1908, show the following values of imports of materials from Canada as compared with the year previous:

	1906-7	1907-8
Brick, stock or common	$ 724	$ 1,438
Brick, facing and fire	1,198	1,766
Cement	2,074	515
Iron of all kinds	2,252	5,098
Iron and steel railway bars	2,336	8,930
Iron and steel bridges, columns, etc.	49	988
Nails	14,460	10,661
Paints	42,216	49,618

Ordinary painters' colors in oil, preferably transparent colors, such as burnt black and raw sienna, burnt and raw umber and lampblack, are best for coloring putty. Make the putty several shades darked than the wood, as all woods grow darker with age.

We Have Always in Stock:

Crushed Stone

For Fireproof, Sidewalk or Road Construction

Lehigh Portland Cement Building Stone Lime Builders' Supplies

C. P. R., Grand Trunk, M. C. R. and T. H. & B. Railway Delivery.

Rogers Supply Company

Head Office: 3 King Street East, Toronto

Phone Main 4155

YARDS:
Foot of Berkeley St.
Foot of Bathurst St.
Foot of Church St.
256 Lansdowne Ave.
C.P.R. Crossing North Toronto.
G.T.R. Crossing Pape Ave.

ESTABLISHED 1886

Contract Record

In which is incorporated

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Vol. 23 Toronto, May 12, 1909 No. 19

The Spring Number—A Word To Our Readers

The publication of the annual spring number of the "Contract Record" and the arrival of another building season, afford a good time for drawing the attention of the readers of the "Contract Record" to the efforts which have been made during the past year, and those which will be made during the present and future years, to make this publication of increasing value and interest. In the first place, thanks must be given to many readers who have taken an active interest in the "Contract Record," without whose assistance and advice it would have been impossible to obtain whatever measure of success has been ours. With a continuance of this support the future looks unusually bright and the readers of the paper may expect that they will find it continually more interesting. It is in the measure of the support of its readers that the success of a publication is shown. The "Contract Record" therefore feels some pleasure in reflecting upon the interest its readers have shown and hopes for an even greater appreciation in the future.

As to the usefulness of the paper to its readers and advertisers and to the building, contracting, architectural and engineering professions in general, the past year has brought forward many renewed assertions of its value. We believe, without any feeling of undue elation, that these professions need, more almost than any others, the services of a journal which will place before them the developments in their line of work that are the result of the efforts of those who are planning, draughting, designing and constructing the buildings and structures that mark the growth of Canada. Those who are engaged in the constructional professions in Canada to-day realize that they are playing a large part in the development of the country. They must be everlastingly at it if they wish to keep up with the procession. They cannot do much more than attend to their own undertakings and have little or no time for studying the undertakings of others, unless presented to them in readable form in their own offices.

This is the work which the "Contract Record" seeks to fulfil and for which it hopes earnestly to receive increasing assistance from those whose interests it serves. Those who are assisting the building of Canadian undertakings owe it to their fellows to place before them some of the information which they continually obtain from their works. Their slack seasons, fortunately for them selves and for the profession, are few and far between, yet they should not wait for the slack seasons before giving some of their time to the preparation of descriptive articles, for the purpose of publication. In the preparation of such articles, the writer frequently develops ideas of value which would otherwise escape him.

The usefulness of a technical journal is not confined to those who read and those who write. The advertisers are a very live and interested clientele. If they do not find that the public are interested in the paper, they will not continue their patronage. Advertisers in the "Contract Record" have fortunately been able to testify that they obtain from it results which cannot be obtained in any other way. They have given practical demonstration of this by regularly increasing their space, and by stating without reserve that they are well pleased with the results obtained.

The present issue is one which we feel will be of unusual interest to readers. In addition to a number of timely articles on subjects of wide range, the announcement of a competition for students' designs for a moderate cost residence should awaken an interest among those who are studying with a view to taking up the profession of architecture. It will be a matter for congratulation for all concerned if this competition results in bringing forth designs of distinct merit.

Life is simply time given to man to learn how to live. Mistakes are always part of learning. The real dignity of life consists in cultivating a fine attitude toward our own mistakes and those of others. Man becomes great, not through never making mistakes, but by profiting by those he does make; by being satisfied with a single rendition of an unwise act, not encoring it into a continuous performance; by building a glorious to-day on the ruins of his yesterday; and by rising with renewed strength, finer purpose, and freshened courage every time he falls.

May 12, 1909

Rigidity a Drawback in Building By-Laws

Modern Construction Methods in Reinforced Concrete Prevented by Toronto's Regulations. City Architect Should Have Greater Freedom in Interpretation

Attention is called to the letter elsewhere in this issue regarding the attitude of the building by-law of the city of Toronto toward reinforced concrete. The writer of this letter is a structural engineer of ample experience in his specialty to give weight to his opinion, but because he is occasionally asking the favor of a permit from the City Architect he has preferred to state his views only on condition that his name be withheld. While his letter deals with only one portion of the by-law, it calls attention to the fact that the entire subject has long been a sensitive one among architects and contractors.

The object of a building by-law is two-fold. First, it must insure safety to the occupants of buildings. The tenant must be guaranteed that the structure he leases is not dangerous to his life. Second, it must assure the citizen of protection from injury due to the wrongful construction of adjacent buildings.

When a building by-law attempts to do more than these two things it exceeds its rightful functions. If it interferes in any way with the construction of buildings which neither cause danger to their occupants nor infringe on the rights of the general public, it becomes a nuisance. If it causes the use of more expensive material or greater quantities of material than the best architectural practice would dictate, it becomes to this extent confiscatory.

A Treatise on Building Construction.

The framers of the present Toronto building by-law evidently intended it to be the best that was ever written. With this in mind they made it exhaustively complete. It fixes definitely the thickness of brick walls in every possible situation, directs authoritatively the manner of computing stresses, and, in fact, is little short of a treatise on building construction. In their desire to be complete the framers evidently forgot that their object was to ensure public safety and not to instruct architects. They also overlooked the fact that no system of rules, on such a complicated subject as building construction, can be made sufficiently complete to supersede common sense. They have entirely neglected to give the City Architect any discretion in over-ruling the letter of the law in any case.

For example, the by-law, on page 19, provides that all fireproof buildings over one hundred feet high shall have window frames and sash of metal, or wood covered with metal. The compilers of the law have evidently had in mind the metal frame and wire glass windows specified by insurance underwriters for use in fireproof buildings when placed immediately adjacent to combustible structures. They forgot entirely, however, to mention wire glass, and they entirely overlooked the fact that it is the fire exposure of a building that demands window protection, and not its height. The City Architect is therefore called upon to multiply by two or three the cost of window frames in a certain class of buildings without the owner securing any return, yet he cannot enforce the use of metal frames or wire glass in places where such material would protect a small building otherwise fireproof.

On page 21 of the by-law is a clause demanding that in the skeleton construction used in modern office buildings the outside walls shall be 14 inches thick for the upper seventy-five feet and for every sixty feet below the top section there shall be added 4½ inches to the thickness of the outside wall. In this type of construction the outside walls carry nothing. They merely keep out the weather. Their increased weight adds to the cost of the framework as well as to the cost of the wall. It is hard to see, too, what right the by-law has to refuse to allow the weather to keep out with less than 14 inches of wall. A 9-inch wall constructed with proper materials and enclosing dead air spaces should be enough, and for a building not intended to be heated, a 6-inch concrete wall could meet with no structural objections. Yet if the City Architect should be asked for a permit to erect such a building he would have to refuse it.

An Out-of-Date By-law.

The by-law is evidently an old one, or at least its constituent parts are old. On pages 70 and 71 it specifies in detail the stresses to be used in designing wrought iron columns and girders. Wrought iron rolled shapes have not been manufactured for about ten years, and it is safe to say that not a single wrought iron beam or column has been used in Toronto for the past six years. The old ones have been in use for some time and it is hardly fair to legislate regarding their carrying capacity at present. The by-law also provides that built-up girders shall have a safe flange stress of 14,000 pounds per square inch, and neglects to allow any portion of the web area to be considered as flange area. The generally accepted practice, except for railroad bridges, is to use a safe working stress of 16,000 pounds, and to consider one-eighth of the web as flange area.

Engineers generally estimate that a reinforced concrete framework can be substituted for a properly fireproofed steel one in a warehouse or office building, at a saving of about half the cost of the steel construction. This is true everywhere except in Toronto.

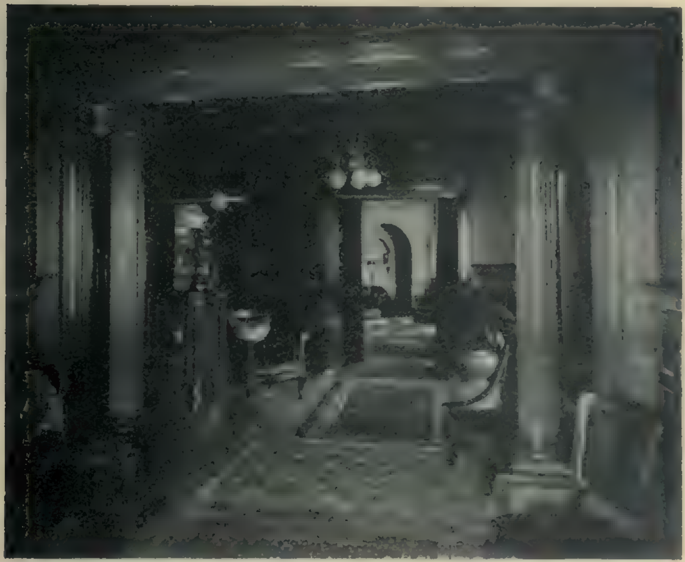
Any estimate of the amount of money wasted in Toronto owing to the clauses in the building by-law which are needlessly conservative and wasteful of material must necessarily be a guess, yet it could easily amount to three or four hundred thousand dollars annually. Nobody gets any adequate return for this expenditure. Value is not cost

Toronto can do no better in showing her desire to welcome new industries than to offer a sane and adequate building by-law. The old law is good in most features, but it needs revision. The objectionable clauses should be eliminated and the law as a whole should be restricted to its proper functions. A clause should be added allowing the City Architect to use his discretion in the application of the law. If the City Architect objects to the increase of his powers, or the city fathers object to granting him discretion, a board of, say, three consulting architects and engineers should be appointed, with whom he could advise and who could share the responsibility for changes with him. The cost of such consultation could be arranged by fee and the fee could be assessed against the builder who appeals from the architect's decision

Attractive Residence at Sherbrooke, Que.

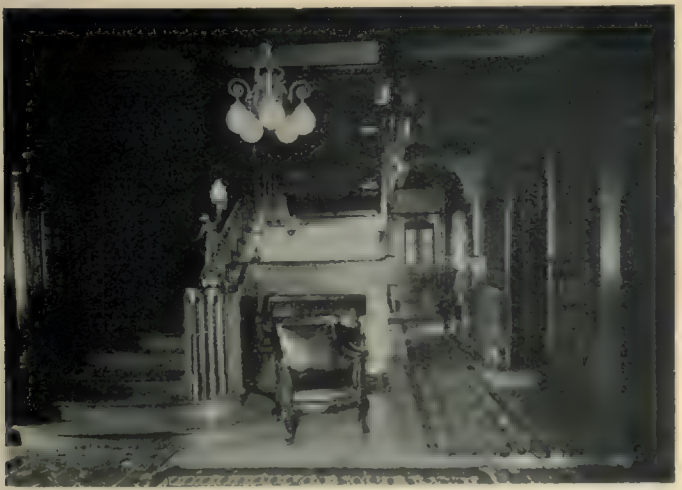
Interesting Solutions of Problems in Interior Planning. Pleasing Schemes of Design and Finish.—C. E. White, Architect

The illustrations of a residence published herewith give exterior and interior views of a house recently built for Mr. F. N. McCrea, of Sherbrooke, Que.



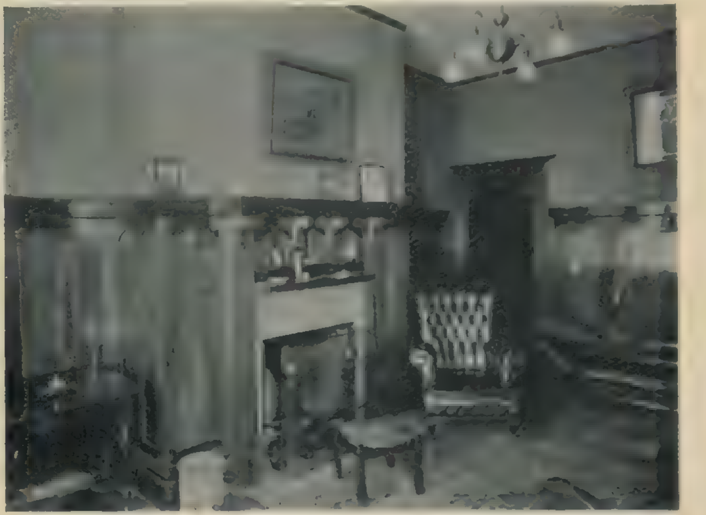
Residence at Sherbrooke, Que.—Hall looking toward living room.

The building is of brick, in the Colonial style, and is situated at the corner of Queen and Melbourne streets. The location of the site, and the nature of the surrounding scenery, are such that it was necessary to place the front of the house towards the north, facing Melbourne street. This northern exposure naturally became an important factor in the design and location of the rooms. The prevalent winds being north and north-west, the usual arangement of a central hall had to be modified, as will be seen from the plan, and as those parts of the house most in use claimed protection and the bulk of the available sunlight, the drawing room, which is least used, was placed in front.

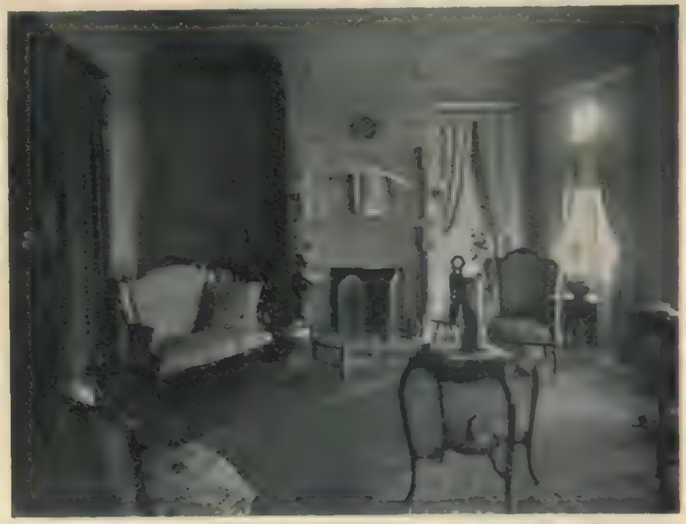


Residence at Sherbrooke, Que.—View of hall from drawing room.

All the rooms on the first floor, with the exception of the drawing room, are finished in the natural wood. The hall and dining room are in quartered oak. The office, breakfast room, living room and library are finished in black cherry. The drawing room is finished in white enamel and decorated in Louis XVI. style. The service portion of the house is finished in North Carolina pine. The second floor is finished in oak. All bedrooms, except the one over the office, are finished in white maple. The servants' quarters on the second floor are finished in North Carolina pine. On the third floor, the studio and bedrooms adjoining it are finished in bird's eye maple. The rest of the third floor is finished in North Carolina pine. The sanitary arrangements throughout the house are of the most modern description. The house is heated by steam throughout and has a series of extensive cellars, the laundry being placed directly under the service portion of the house and fitted with all modern

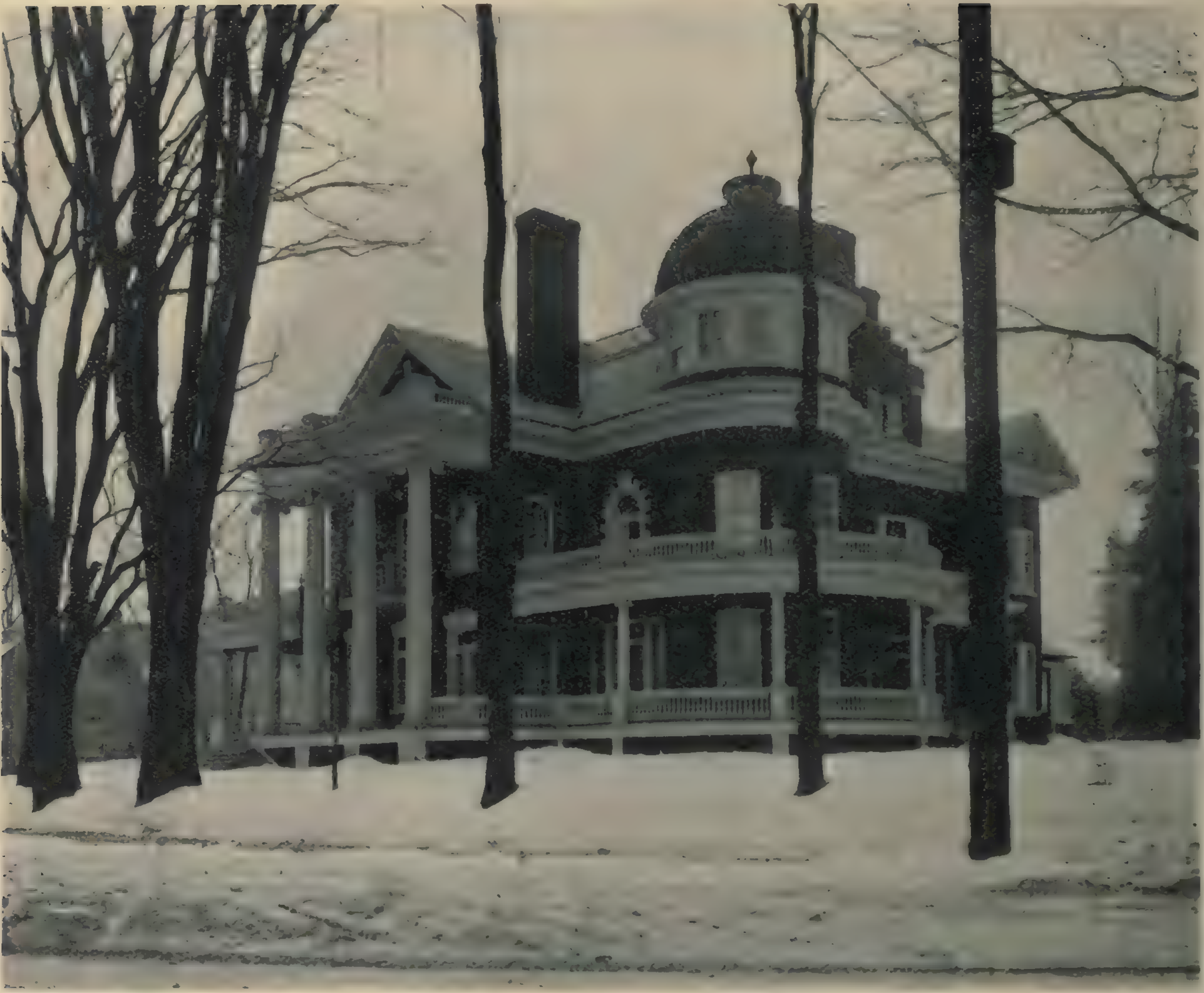


Residence at Sherbrooke, Que.—The Office.

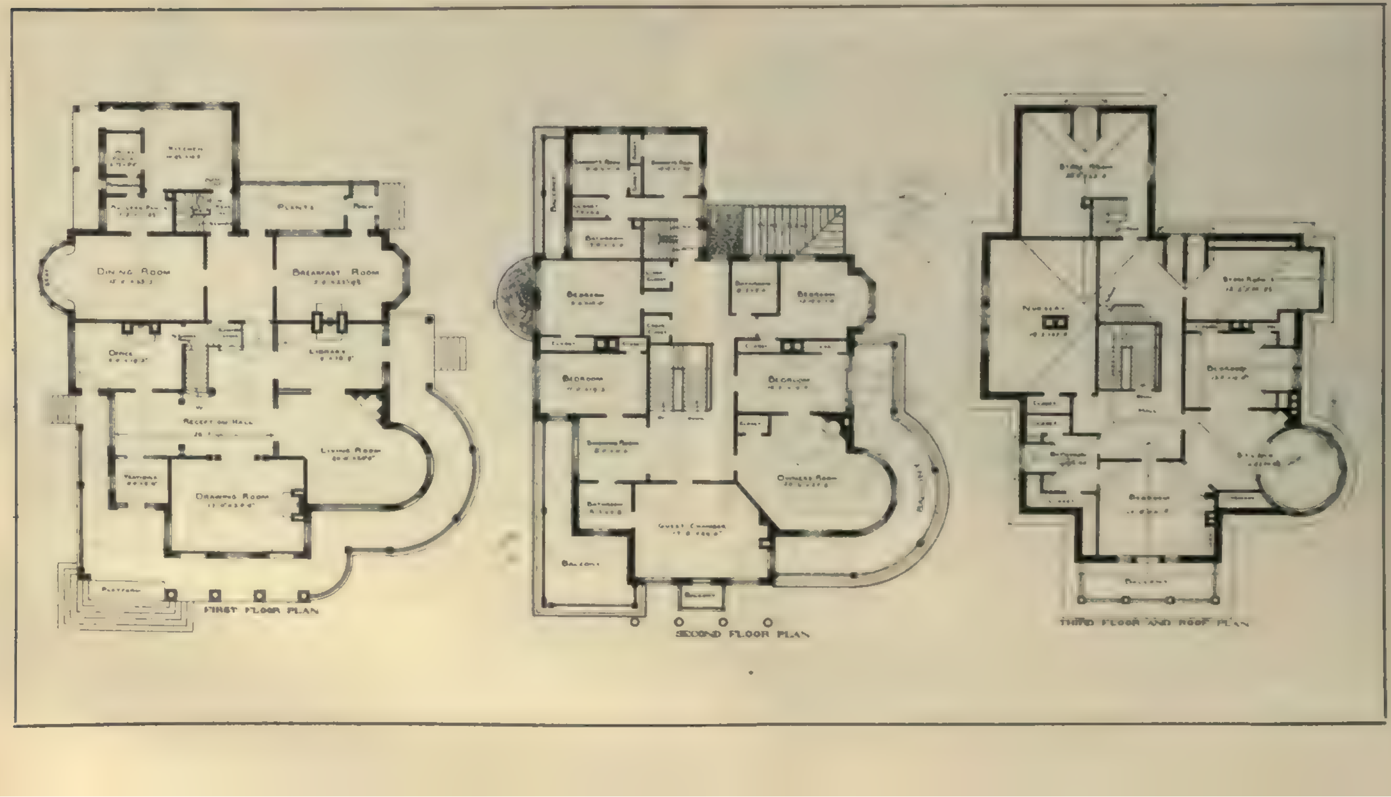


Residence at Sherbrooke, Que.—The Drawing Room.

(Continued on page 60)



Residence for F. N. McCrea, Sherbrooke, Quebec—C. E. White, Sherbrooke, Architect.



Residence at Sherbrooke, Que.—The Dining Room.

Residence an Sherbrooke, Que.—The Living Room.

Spring Suggestions for House Painting

By James Phinnemore

The season of the year has arrived when it is necessary to begin outside painting. The question is often asked, when is the best time of the year to do it, and is there any difference in the durability of the work, according to when it is done. Our answer to the first question is that either the early spring or early fall is the best time of year to do exterior painting. In midsummer the weather is too severe, because of the intense heat, which dries the paint too fast and also destroys the life of the oils which compose the chief ingredient and ensures the wear of the paint. In summer also a good job is often spoiled by the multitudes of little flies which cover the whole surface and if the paint is of a light color they destroy the beauty of its appearance.

Early spring weather, if free from rains, is very much preferable to summer because the paint undergoes a slower process of drying and therefore hardens from the foundation to the outer coat. Much the same can be said in favor of the early fall weather, while the winter, because of its frosts and snow, leaves no possibility of a good job of outside painting being done.

The durability of the work is affected by two causes, viz., the severe heat, which tends to blister, and also the extreme cold, which blights and freezes the paint, which, in turn, flakes and falls off. Outside woodwork should not be neglected too long for it becomes weather worn and the elements destroy the face and fibre of the wood and make it impossible for a good job to be done, as the foundation is destroyed. Where this is the case special treatment is needed. Before applying the first coat give it a good application of cold water paint and let it thoroughly dry; then proceed as usual. A good stiff coat of cold water paint acts as a filler and smoothens the surface. Let the first coat on top of this be a thin application, so that it will penetrate and assimilate with the under coating. This will hold firmly together the disintegrated fibres and give a good foundation to work upon.

Shades and colors for exterior work depend a good deal upon the surroundings and the nature of the construction of the house, both in style and material. We would suggest for a red brick, that a pure white trimmed in cream or light green be used; or cream for the body and an olive green for trimmer. For this purpose, get the very best lead, as this will prove the cheapest and best. Mix with three parts of boiled oil and one part of

Residence at Sherbrooke, Que.—The Guest Chamber.

Residence at Sherbrooke, Que.—A Bed Room.

turps for first coat and also for second coat. A nice cream color can be produced by mixing raw sienna with the white lead, sufficient to produce the shade required. A light shade of green is produced by using French imperial green, medium shade and color white lead to depth required. Olive green is produced by taking French imperial green as the base and adding chrome yellow and burnt umber. An amateur, however, should obtain a color card, which can be got from any hardware store or paint merchant, and order his goods ready mixed.

Summer cottages situated among the trees look well when the body is coated in light shades of cream, green, buff, or silver grey, and trimmed in darger shades of the same colors.

Roughcast houses, where the body is already light in shade, should be treated with darker colors, such as purple browns, seal browns, olive greens, etc.

An important part of outside painting is the treatment of verandah floors, as this requires to be done so as to stand the wear and tear of traffic. Paint merchants put up a specially prepared paint for floors, having in view its drying and hardening qualities. In any case, never use the ordinary paint put up for general use, as this does not dry sufficiently hard to walk on, and is often tacky and sticky.

All window sashes on exterior work look best in colors to contrast with the body work. If the main part of the work is dark do the sashes in some light shade, or if the main part is light do the sashes dark.

Of course painting is an art, and whether on the interior of the house, where all the delicacy of harmony is required, or on the exterior, with its bold characteristic qualities, it requires the artistic touch of the master mechanic to ensure perfection and beauty.

Attractive Residence at Sherbrooke, Que.

(Continued from page 57).

appliances. The roof is of slate, except on the tower, which is covered with graduated glazed Spanish tiles The view along the beautiful St. Francis valley forms a fine picture from any portion of the front of the house and as a whole the building is a representative of the best type of Canadian home. It was erected at a cost of $23,000, exclusive of the site. The architect was Mr. C. Edward White, of Sherbrooke, Que.

Among the recent inventions is a lath holder which has been invented by two brothers who reside in Colorado. It is designed with the idea of saving lathers from the necessity of stooping over to the floor or platform whenever they want laths. This device is made to fit over the shoulders—the shoulder pieces being padded underneath—and buckle around the body. In the back are two supporting arms capable of holding a bundle of laths and projecting far enough in the rear to be out of the way of the workman.

Competition for Architectural Students

Designs for a Moderate Cost House

The "Contract Record" has decided to conduct a competition for students in architecture, for which three prizes of $20, $10 and $5 will be given. There are a great many young men of exceptional talent, who are studying architecture throughout Canada, and it is hoped that this competition may assist in bringing some of them to the front, and also provide an interesting means of comparing the methods and ideas of students in different parts of the country. The subject chosen for competition is a small residence in the suburbs of a city, or in a town or small city. Such a subject, while affording no scope for massive conception, is intensely practical, inasmuch as the small residence of moderate cost is more in demand than any other class of building. It provides, moreover, much scope for originality in treatment, and skill in the adaptation of the building to its surroundings.

The other details of the competition are as follows:

Three members of the Ontario Association of Architects will act as judges. They are Messrs. H. B. Gordon, of Gordon & Helliwell, Toronto; James Gemmell, of Smith & Gemmell, Toronto, and H. Sproatt, of Sproatt & Rolph, Toronto.

The competition will be open to all Canadian students in architecture.

Designs are to be for a suburban, town or small city residence, to cost $2,500, on a permanent foundation, the lot to be 50 x 150 feet. A house with an extended front will be preferred rather than a deep one. The building is to be kept back from the roadway 50 feet, and path, grass or garden are to be shown in front and vegeable garden, shrubs or fruit trees plotted out.

The accommodation is to be as follows:

First floor:—
  Living room ....12 x 18 square feet.
  Kitchen ....12 x 10 square feet.
  Entrance hall, stairs, vestibule and coat room, pantry, study, verandah.
Second floor:—
  Study, 8 x 12 square feet.
  Bathroom and three bedrooms.

The materials of construction are to be concrete for the cellar, and wood boarded frame, finished with shingles, clapboard or plaster.

The designs are to be drawn to scale of ⅛-inch and to include three plans and two elevations, also perspective if desired, but not obligatory.

Drawings are to be in black ink only, on white paper—walls blacked in. Elevations may be shaded in brush or pen work. The drawings are to be sent to the Editor of the "Contract Record" not later than June 31 next, and are to be signed by a "nom de plume" and accompanied by an envelope containing the student's name and address and nom-de-plume, on one sheet of paper.

The decisions of the judges will be published as soon as possible after the close of the competition.

The drawings are to be the property of the "Contract Record," which is to be at liberty to reproduce those which it desires to publish.

A Few Principles for Heating Buildings

Consideration of some of the Main Points to be borne in mind by Engineers By R. W. Kings, C.E., M.E., M.I.A.E.

In the heating of dwellings there are mainly three systems in general use, namely, hot air, hot water, and the heating of rooms by stoves as well as by the furnace in the basement. Stoves are to hot air heating what direct radiation is to hot water and steam, while the hot air furnace in the basement corresponds to what is known as indirect heating; that is, where air is heated or warmed and then conducted to the apartment where required, expelling the air that was in the apartment and replacing it with the warmed air, from the heating apparatus, by hot air flues.

It is impossible to consider the proper heating of a building without also considering its ventilation, these two subjects really go hand in hand. In considering the heating of a dwelling by indirect radiation of any kind, at first thought it might appear that the indirect system of heating would provide the best means of ventilation, since, instead of simply heating the air in a room already more or less foul, this air is driven out and replaced by air freshly heated. On looking a little closer into the systems in general use, however, it will be found that the foul or used air is not really driven out but is simply returned to the furnace to be reheated, re-entering the apartment charged with additional foul air emanating from leaks in the furnace, encouraged by the suction of the hot air flues. It is true that in properly installed hot air furnaces means are provided for introducing fresh outside air, and where this is done the heating of dwellings by hot air furnaces can be very much improved. The introduction of the cold outside air, however, means the burning of an additional amount of fuel to heat the same and generally results in the fresh air flue to the furnace being kept religiously closed, thus, for all practical purposes it might be entirely omitted, were it not that it is a relief to the conscience of the proprietor to know that it is there, and for the agent of hot air furnaces it makes a good talking point.

A general fresh air flue to a furnace, for instance, cannot be brought to bear on an individual apartment that may require ventilation, when the balance of the dwelling does not, and may already have more fresh air forcing its way round doors and windows than the coal pile in the cellar is sufficient to take care of. Since every apartment in a dwelling is provided with at least one window it naturally follows that when fresh air is needed in that particular apartment only, the occupant goes to the window to obtain the desired supply. By judicious management fairly good results may be accomplished in this way.

The above illustration points to the true method, or principle, involved in the heating and ventilation of a building. The true method is one in which both the amount of heat and fresh air admitted to an individual apartment are controlled independently of other apartments in the building. We may even go further than this by referring to some of the more modern systems, where each individual seat has its own separate supply of freshly warmed or cooled air for winter or summer as the case may be and in some instances under the control of the occupant of the individual seat.

Comparing stoves with hot air furnaces, the latter have gained the day, but not on their merits from a health standpoint. It is impractical to put a stove in every room, but not so with the hot air flue. The convenience also of having but one fire to look after, with all the dirt consequent upon the fuel and ashes being kept in the basement, is too great an attraction for the furnace installed in their place. There are doctors, how- average housekeeper, so the old stoves of our forefathers have been relegated to the scrap heap, and a modern ever, who in cases of sickness have ordered the furnace pipe shut off and a stove set up in the sick room, and it was but a few days ago that a doctor was heard regretting the absence in new houses of the old stovepipe holes, that rendered this possible and also afforded such excellent means of ventilation.

A great disadvantage in the way of installing hot air furnaces and indirect radiation is the inability to place the entrance of the warm air where it is most wanted. Cold fresh air is entering by leakage or otherwise at the windows, etc. There is also the cold radiation from the glass, especially where double sash is not used, and some from the outside walls. The hot air entering is usually to be found at the opposite side of the room since, if put where the cold air is entering, it refuses to circulate unless, perhaps, in the wrong direction. Thus we have a hot and a cold side to a room. The heated air rises to the ceiling, passes along toward the outer walls, then falls and, cooling, passes along the floor toward the heated side of the room, causing a draft and a feeling of cold feet. Attempts have been made to obviate this by providing cold air flues to take away the draft from the windows, but this entails too great a complication of flues to be practical for an ordinary dwelling, and even were these installed the objection would remain, that the freshest and purest air entering the room, instead of remaining there to be breathed, is drawn down these flues to the furnace, to be injured by over-heating and to become impregnated with dust and the foul gases of the furnace before re-entering the room as previously referred to. This objection applies largely to all methods of heating apartments by indirect radiation.

On the contrary, in comparing furnaces with stoves, which latter are here referred to as a primitive method of heating by direct radiation, we can place the stove to better advantage as regards its location, while the stove pipe hole provides an excellent means of ventilation. The check draft damper can be placed at such a height as will remove the foulest air of the room, discharging it entirely from the building. The heated stove pipe is thus an ideal ventilating shaft for the individual apartment, as well as a radiator diffusing the heat. It draws used air from the room and by means of the partial vacuum so made compels the entrance of fresh air, to take its place. Thus a system of enforced ventilation is set up. Again, the proper exit for foul air is above the zone of respiration and not at the bottom of the room. I make this statement in spite of the claim made by some hot air men that the foulest air is to be found at the floor line, and am prepared to hold this position against all comers.

In passing on to the more expensive class of dwellings, where hot water or steam heating apparatus is installed, the question of direct or indirect radiation assumes a less serious form. The advantages of the stove system of heating as compared with the furnace are at once adopted and, we may add, enlarged upon, since more than one heater or radiator, equivalent in direct radiation to a small stove, is often placed in the same apartment

It is usual to place the heaters either under or near the windows. The fresh air entering the windows then at once comes in contact with the heated air that is warming the apartment without causing the draft of cold air across the floor as previously referred to. In this connection it may be well to refer to a special ventilating hot water or steam radiator with an arrangement by which fresh air from the outside is admitted to a chamber at the base of the radiator, where it is warmed and delivered at a temperature not less than that of the apartment. The objection to this, however, is that in careless hands the radiators are liable to become frozen.

Thus, in the better class of dwellings using hot water or steam for heating, the principle of heating by direct radiation, as by stoves, rather than indirect, as in hot air furnaces, is followed, with the result that in spite of the extra expense of installing hot water heating as compared with a hot air furnace, the former is fast gaining ground and taking the place of the latter, even in the cheaper classes of dwelling houses. In offering a house for rent or sale one of the first questions asked is what kind of heating. If by hot air furnace, down goes the value of the dwelling, either to rent or sell; but if by hot water, the answer is perfectly satisfactory.

The Heating of Large Buildings.

Leaving hot water heating to moderate sized dwelling houses, we pass on to the larger classes of buildings, such as offices, hotels, apartment houses, and so forth, including some of the larger dwellings. Here, hot water and steam become rival systems. With hot water, gravity system, much larger main pipes are required to conduct the heat to distant apartments, the pipes and radiators being at all times filled with water, and the latter (properly) being located under or in close proximity to a window, it becomes an easy matter for careless attendants to alow a radiator to become frozen, which, when it thaws out, adds to the damage of the burst radiator the liability of serious damage by water to the apartments below. This has led to a call for a system of heating by which such accidents cannot occur, or are less liable to occur. This is found in a steam heating apparatus, but with the inconvenience that the heat is not as conveniently controlled, except in cases where the expense of installing automatic temperature regulation is resorted to, in which case (and other details of installation being correct) as far as heating only is concerned, we have a fairly perfect system, in many ways preferable to hot water heating for large buildings.

The extent to which steam heating can be extended is well illustrated by referring to the progress made in some cities in heating whole blocks of buildings by steam from a central station. For instance, there is in New York a steam heating company from whose plants the following notes were taken a few years ago: In their down-town station there was installed a four-storey boiler house, each flat being filled with boilers, one above the other. The steam made was conducted away by three high pressure mains, each 15 inches in diameter, 90 pounds pressure to the square inch being carried. These supplied 17 miles of main steam pipes laid under the city streets. Steam was supplied over a radius of 1½ miles, or a circle of 3 miles in diameter. In some cases, steam engines were supplied 1½ miles from the boiler plant, the exhaust from the engines being used for heating. The fuel burned was hard coal screenings, with fan blast, the amount burned being 500 tons per day in winter and 350 tons per day in summer.

That this system was a financial success may be inferred from the fact that at that time another station further up town had been installed in a residential district and solely for heating. In this station, instead of installing boiler floors, one above the other, very high boilers were used, so that all the stoking was done on the ground floor. The boilers were in outward appearance like large brick cylinders set on end, completely surrounded at the bottom with fire doors. For each boiler a gang of hand stokers were constantly engaged at firing, passing round the boiler, taking each fire door in turn. These boilers were of the Jumbo pattern, which was exhibited as one of the special attractions at the World's Fair, Chicago, being of 1,000 h.p. capacity Each of the units or boilers in this station, however, was of 1,500 h.p

This boiler station had to comply with the smoke by-laws of the New York City residential district, and the compliance was complete. Not only was there no smoke, but no dust or fine ash was allowed to be discharged from the stack. The smoke or products of combustion left the boilers proper at a temperature of 650 degrees Fahr., and handled by mechanical draft was delivered to Burpee economisers, where a certain amount of settlement was obtained. Leaving the economisers at a temperature of 250 degrees Fahr., a little over the heat of the boiling water, it was then conducted to a large settling chamber where baffle plates assisted in removing the solid matter and dust from the products of combustion, which would be now misnamed if referred to as smoke. The solid matter was then removed by teams in waggon loads at a time. The temperature of 250 degrees Fahr. referred to as leaving the economisers was further utilized in raising the temperature of the feed water from 40 degrees to 120 degrees in a storage tank, the economisers afterwards bringing it to a temperature of 180 degrees before entering the boilers.

In order to ensure the grestest economy in the use of the fuel and to see that the B.T.U. value of the coal delivered is up to guarantee, a special boiler is arranged for testing the amount of water that each pound of coal will evaporate. These evaporation tests are continually being carried on and a record is made of the result every day. Temperature of flue gases is taken to show the state of boilers as regards cleanliness of heating surfaces, and the work of the firemen is checked by chemical analysis of the gases resulting from the process of combustion. All this vigilance is, of course, necessary to the success of an enterprise in which economy in the cost of fuel cuts such a big figure. At the same time, it may be said that in no business where the fuel item, whether for heating, power or other purposes, is an important item in the year's expense account, should such matters as these be neglected.

More details in regard to the conduct of this heating plant might be of interest to some readers, but enough has been said to illustrate the possibilities that lie before the steam heating engineer. The benefits of such a plant to a community like New York, or in fact to any large city, can hardly be over estimated or even realized, in the doing away with individual fires, which being unscientifically managed distribute their foul gases, smoke and dirt retail throughout the residential districts, as well as the manufacturing localities of the city, which latter are worse mainly, in degree.

Along with high pressure steam heating distribution, with reducing pressure valve where the steam enters the building, there are other systems which occasionally make claims to pre-eminence, as, for instance, the so-called vacuum system of steam heating, by which blocks of houses are claimed to have been successfully heated. This system instead of using pressure at the boiler end, depends on a forced circulation by suction or vacuum pumps at the return end. It has the advantage of an easier control of the steam radiator by the inlet valve, as in hot water, and gives a milder heat, as in hot water, but for lengthy distribution its powers are limited and it may also be said that its claims for economy over other systems have no scientific basis. No matter how heat may be distributed as long as it is not wastefully applied, the first elements of economy are to be found in the furnace room, in the capturing for the use of the distribution plant the greatest possible number of heat units from the fuel consumed, before the products of combustion are discharged into the atmosphere; and this rule applies to every class of heating apparatus. So that it is not the economy of one system over another that need be considered, but the proper installation of the particular system adopted, whereby any unnecessary waste of the heat units imparted to it may be avoided.

Modern Adaptations of Hot Water Heating.

Not to appear to neglect some modern adaptations of hot water heating, mention is made as follows:

Superheated hot water heating:—By means of heating the water to a temperature above the boiling point. This can be done by keeping the water under pressure above the atmosphere, corresponding in amount to the degree of superheating required. Smaller radiators and mains may be employed, but the extent to which this can be done is very limited, while the liability to accident from over pressure is increased, not from the pressure only, but from the fact that on a rupture occurring the discharge is with great force, while a large amount of the escaping superheated water flashes into steam, with a result approaching that of a steam boiler explosion.

Mechanically forced hot water circulation:—There is some hope for this system, in extending the possibilities of hot water circulation in the larger plants, but as it requires the maintaining of some mechanical power to force the circulation it is not applicable to domestic use, and, like the superheated hot water system, it is very limited in extent as compared with a steam system. It has to be considered also that to keep mechanical power in operation costs money and it is hard to realize, from any theory so far advanced, why it should have any advantage in economy over a gravity system, provided the gravity system in the first place has been properly installed. It may show good results when applied to a gravity system too much extended, or, in some other way, not correctly installed.

In further considering the heating of large buildings indirect radiation by mechanically forced circulation must not be lightly passed over. In this system a hot air chamber is provided, preferably heated by banks of steam coils. A power-driven fan either forces air into this chamber or draws heated air from the chamber and by means of warm air flues conducts it to the various apartments to be heated. With forced circulation these warm air flues may be made to open at any desired point in the apartment. Exhaust air fans also may be used to draw the foul air by another series of flues from any desired points in the apartments being heated, and return it to the heating chamber or discharge it out of doors—or the warm air may simply be discharged into the apartment and the foul air left to find its way out the best way it can, but preferably through proper ventilation openings left in the room and leading to upright flues discharging some four or more feet above the highest part of the roof.

To make these plans complete, means are taken to restore the fresh air introduced to a proper state of humidity consistent with the degrees of temperature that have been imparted to it. Air in being cooled or frozen loses a large portion of its natural moisture by condensation, forming rain or snow. On introducing cold air into a building and warming it artificially, it is expanded like a dry sponge and seeks to regain the moisture lost by its previous condensation. To impart to the reheated air its proper degree of moisture without overdoing or underdoing it, is perhaps the most difficult problem in artificial heating.

Steam being used to drive the fans, as well as to do other work about the building, as the operation of elevators, etc., the heat of the exhaust is utilized in the heating of the steam coils in the hot air chamber. Systems of this kind may be made very efficient in the proper heating of a biulding ,but are only applicable on a large scale, are expensive to install, and require the constant care of an expert attendant in order to obtain satisfactory results.

Mechanically Forced Circulation.

Perhaps the best example of a mechanically forced circulation system of heating and ventilation may be found in the Capitol building at Washington, D.C. A portion of the apparatus installed for heating purposes in winter is also made applicable for cooling the apartments served by the system during the summer. For the prevention of drafts in the larger apartments warm air is introduced through a multiplicity of openings in the floor of the chambers, and the foul air is removed by a multiplicity of openings about the ceiling, ensuring a quiet and even exchange of air in all parts of the chamber. To ensure this the temperature of both the incoming and outgoing air has to be very carefully watched. This is done from the chief engineer's office in a remote part of the building by means of electric thermometers placed at the necesary main points of exit and entrance of the air before and after being used, in the various apartments to which the system is connected.

In the engineer's room is a switchboard with a number of electric buttons, numbered to correspond with the different locations in the building at which temperatures have to be observed. Above the switchboard is a temperature-indicating dial, with its pointer normally standing at zero. When the engineer desires to know the temperature of any distant point in the system he presses the corresponding button, which causes the index hand to move around and indicate the exact temperature at that point to the fraction of a degree.

There are instruments made on this plan, whereby the temperature of an apartment is automatically recorded for every minute day and night, though the recording instrument may be a mile away from the point where the thermometer is placed, but none of these were noticed in the building referred to. One of these may be seen at the Observatory, Ottawa, where the temperature of the clock room is automatically recorded in the office of the Observatory.

The way fresh air is introduced in the building referred to is as follows: An underground tunnel connects the building with a central position in an adjacent park opening out amongst the trees and shrubbery. An immense fan, probably about 24 feet in diameter, draws air from the park through this tunnel. The tunnel is provided with heating pipes for summer and cooling pipes or ice for winter use. An electric thermometer at the building end of the tunnel records, at the will of the engineer as before explained, the temperature at this point and enables him to make necessary adjustments, or wire instructions necessary to have it done. In the Chamber of Representatives the fresh air from this tunnel, properly heated or cooled as the requirements of the season may demand, is delivered at the side of each member's seat and is under individual control.

A few words more for the steam heating apparatus in good-sized dwellings , Reference has been made to the difficulty in applying hot water or steam in a way to avoid accident by frost. It is also known that the heat from a steam radiator is difficult to control, when there is an abundance of steam pressure on the system ready for all demands. The heat in such cases requires either to be fully turned on or fully turned off, though with those accustomed to the use of steam heating, the heat of the coils or radiators may be regulated fairly well by the air bound plan. Still, where strangers interfere with the valves, water is liable to accumulate in a coil and trouble result.

An Ingenious German System.

While staying at a first-class hotel in Germany a very neat and effective way of regulating steam heating was observed. The steam heating coils were of pipe placed close under the windows of the rooms, bedrooms included, and close up against the walls, so as to occupy very little space. There were no valves of any description, so the circulation was perfect, with no noise of any kind. An outer case of some non-conducting material ornamented or papered to correspond with its surroundings completely closed the radiator in. This case was provided with a hinged cover, narrow, but running all the length under the window. Means were provided for adjusting the opening of the cover. If you did not want the heat you closed the cover down. If you wanted heat you opened it to the necessary degree. As this opening was placed immediately under the window or windows, if you wanted fresh air and heat at the same time you had them at command in a way best adapted for the prevention of draft previously referred to.

In spite of the open window for fresh air, which may be assisted by the introduction of various screen systems on the market for the prevention of draft, we still miss in the modern house the old stovepipe hole referred to in the doctor's lament. There is no question but that in our modern houses to-day the matter of a proper ventilating system or means of egress for foul air is an item that is sadly neglected. This neglect may not be so serious in an ordinary dwelling where the good housewife makes free use of the open window to air the rooms at least once a day, summer or winter, and sleeps at night with some opening of the window, proportioned to the severity of the season, but we have in Toronto an example of a modern high office building crowded through the day with hundreds of occupants, in which no means whatever outside of the open window seem to have been provided for ventilation. When being consulted on a question of ventilation for individual offices therein, it was said that tenants were leaving the building owing to bad ventilation. Others complained that they could not put in more than half the day without feeling great distress and an apparent desire to get out into the fresh air. Others were found installing different kinds of screen systems for the open windows of the individual apartments.

An examination was made of the main stairway and elevator shaft. This was tightly sealed at the top, a true extinguisher, not having an opening of any kind, not even a crack by which the least particle of foul air could escape or fresh air find entrance. In this building, towering above its neighbors, subject to wind pressure from varying quarters, attempts to gain fresh air by the opening of windows resulted somewhat as follows: If on the windy side, the air pressure was so great that the least opening caused draught, draught too, that would blow the papers off the occupant's desk; even where this was broken by screens. We found the windows closed, because certain young lady typewriters who had to work under the windows complained that if there was the least opening, even at the top where foul air was supposed to go out, they could not stand the draft on their heads. Passing over to the opposite side of the building the conditions were different. There the windows could be opened, but in spite of the opening and the patent screening introduced no fresh air would enter. Examination revealed that on this side of the building when windows were opened the inside air was going out, so that in apartments so placed the opening of a window for fresh air resulted in turning the rooms into the foul air exits of the building. This is no exaggeration, and references are ready of a substantial character to corroborate what is here written.

Without proposing to pose as an expert on ventilation as compared with the learned architect who designed that building, and whose residence you will have to go out of Canada to find, a little horse sense would suggest that if he had only given a series of ventilating shafts extending some feet above the highest part of the roof, corresponding to the old chimney flues we used to have in buildings, and had left us in addition the old stove pipe holes opening into the various apartments, that the proper and efficient ventilation of the building would have been a very simple matter and quarters therein would be worth considerable more money than they are to-day.

The Danger of Rules and Formulae.

Rules and formulæ: It is not the purport of this paper to advance any set rules or formulæ for the heating of buildings. There are plenty of them in existence to-day and it may be said of them, as of many other set forms of belief and conduct, that they may be made, to a large extent, obstacles in the way of progress and a hindrance to independent thought and action, by which alone that experience can be gained which should place the present generation in advance of those that have gone before. For instance, in arranging the radiation for an ordinary dwelling it has been customary to estimate the amount required in proportion to the cubic feet of space to be heated. On estimating to heat an ordinary three-storey house the contractor may say, for corner rooms with two exposed sides, these should have in heating value six lineal feet of one-inch steam pipe to the 100 cubic feet of space; other rooms on ground floor, less exposed, 4 or 5 feet; for the lower hall, 8 feet; or, if by indirect radiation with an allowance for the introduction of some outside air for ventilation, make it 10, 12 or more feet. For the floors above, about half the amounts named. He will then look for a total on the whole dwelling of about 3¼ lineal feet of one-inch steam pipe in direct radiation to the 100 cubic feet of space heated. If by hot water heating, the amount of radiation may be in the proportion of 8 to 5, or nearly double that of steam. Though this rule works out fairly well and the example quoted is taken from a successfully heated house in Toronto, in principle it is all wrong, for the reason that the cubic contents of a building have nothing to do with the amount of radiation required to heat it.

What has to do with the heating requirements, is the amount of exposed outside surface and its value as a non-conductor of heat and cold. The roof, also counting as exposed surface, is in large buildings, such as halls and churches, a main consideration. In estimating the amount of heat radiating surface required to heat any building, the co-efficients of value as non-conductors, of the different classes of walls and roofs, glass, etc., are the engineer's first consideration, and in addition to this he has to consider the location and the geography of the situation and modify his co-efficients accordingly. Any one who wants to do original work along these lines is advised to treat the average rules with suspicion and make his own, based on the observation of the work of others and the experiences gained from his own successes or mistakes.

In considering the heating of buildings or apartments covering large areas it is a great mistake to suppose that such rooms can be successfully heated by placing steam or hot water coils at the side walls only, whether at the floor or the ceiling, and especially if there is any glass in the roof or it is otherwise a cold surface. Some great mistakes are to be found along these lines in various lecture rooms in Toronto, connected, too, with its principal educational establishment. It has been previously explained that it is wrong to have one side of a room heated and the other side cold. It is equally wrong in an apartment spread over a large area to have the sides warm and the centre of the roof or ceiling cold, and this is specially the case when such a building is lighted by glass in the centre of the roof. It may be immaterial whether the heat radiation is placed on the ceiling or on the floor, the point to be observed theoretically, is that under every square foot of cold wall or ceiling surface the necessary amount of radiating surface to heat it should be placed.

Let us take, for example, a building of a single apartment erected at North Wales, Pa. This is a greenhouse with a glass roof. It is of single span, 150 feet wide, and something over 500 feet long, and covers about two acres of ground. It is used as a nursery in winter for plants more susceptible to draughts and cold than any human being, therefore the successful heating of such a building has become largely a science on which the financial success of the enterprise depends.

If a man contracts la grippe or pneumonia from sitting in a badly heated assembly room, he goes somewhere else to be nursed, and probably never knows just where he contracted the complaint, but if plants become sick they die or refuse to bloom, and the proprietor is ruined.

Fig. 1 represents by sectional diagram how the same amount of space would be heated when covered by smaller houses in the ordinary way. Even in small houses it is not practical for best success to put all the heat on side walls, the heating pipes usually being distributed at intervals of not less than 4 to 6 feet apart on the floor line.

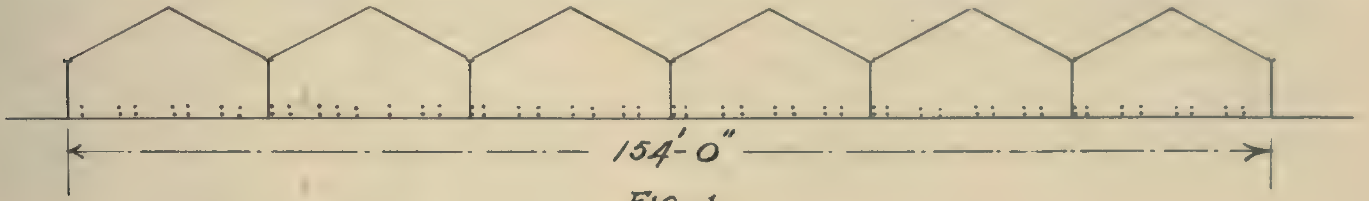


FIG. 1.

:: Represent heating pipes

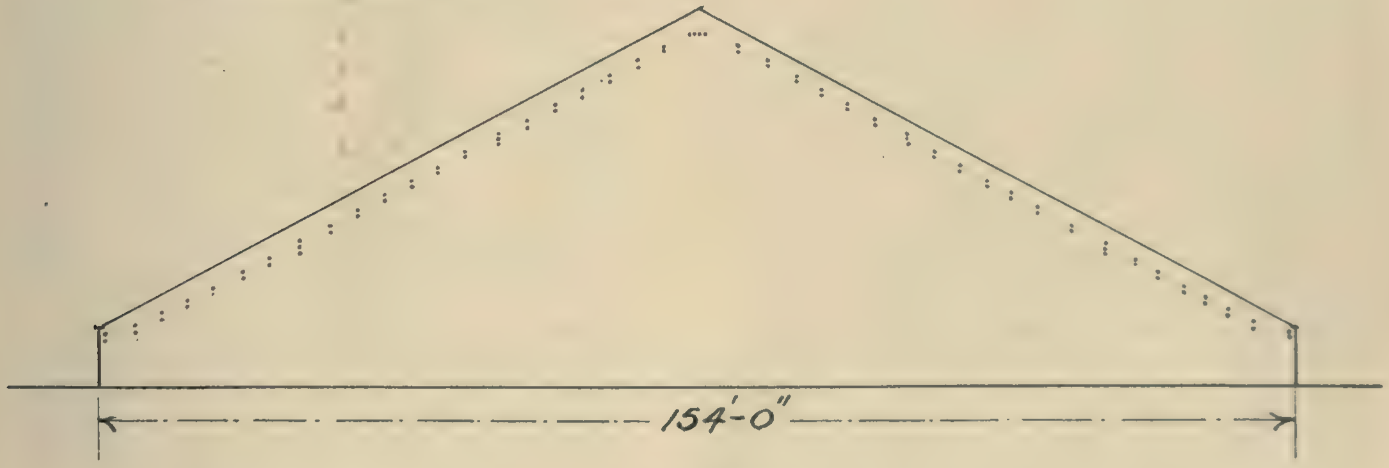


FIG. 2.

The company building the wide house (the first plans for which were made in Toronto), wishing to keep the ground line free for cultivation, broke through all previous records and hung their heating pipes equally distributed on the roof close to the glass, only putting on the side walls the proportion properly belonging to their area. In spite of many predictions to the contrary, the growing of American Beauty roses in this house for the New York market, and that after two seasons' trial, has been pronounced such a success that a second house is now under order. This is to be 175 feet wide and of greater length than the one first erected.

Use may be made of figs. 1 and 2 to explain another point before referred to regarding the amount of space heated, having nothing to do with the amount of heat radiation required.

In fig. 1 we have the same area of wall and roof surface as in fig. 2, but in fig. 2 we have several times greater an amount of space to be heated, so according to space rules fig. 2 should take several times the amount of radiating surface that fig. 1 takes. Now the facts are that it takes less, that is in instances where the piping in both cases is placed on the floor line in the same relative positions and the area of glass is the same. This has been demonstrated in a number of instances, and though disputed at times by some without experience, is now an established fact, and we have had to readjust our rules and theories accordingly.

The science of heating would be very much advanced, to the interest of the profession, if some of our schools or colleges would take up the work of obtaining correct co-efficients for the cold-resisting value of the many different wall surfaces as used in actual practice, taking glass as a basis for comparison, so that the results could be tabulated and published in engineering or architectural text books. As it is now in the trades, the obtaining of such values outside of that of glass, is done largely by the rule of thumb. Glass in the location of Toronto, with a temperature required of between 60 to 70 degrees Fahr., will average on all points of the compass in low pressure steam heating from ½ to ⅝ of a lineal foot of one-inch pipe to the square foot of glass, or with hot water, about double, as previously explained.

For the heating engineer who has to design plants over an extended territory it is well in getting his data on which to determine the size of boilers, etc., to acquaint himself first, either personally or by correspondence, with local requirements. Experience gained in Toronto or Montreal, for instance, is of very little use as regards the amount of radiation required in such locations as Winnipeg or Vancouver. For the former, you need to know how much more radiation would be required in buildings of similar size as compared with Toronto, and for Vancouver how much less. This will allow the adjusting of co-efficients to suit the locality; then the rest of the procedure is simple and may be illustrated practically in this way:

All surfaces to be heated having been reduced to a standard glass value, which has again been adjusted to the locality, a rule that has been followed with fair success over a wide experience up to plants exceeding 1,000 to 2,000 h.p., has been to ascertain first the grate area required, by the following method: For hand firing with soft coal, not less than 60-foot stack, divide the surface area to be heated (obtained as above) by 10. This gives the number of square inches of grate surface required to do the work properly. This applies to any class of heating that is installed fairly as regards economy of fuel, since the base value of all heating plants, no matter how the heat is distributed, is determined broadly by the size of the fire. If you intend to burn coke or hard coal with a slow fire with smoke stack not necessarily more than 30 feet high, divide the surface by 4½ instead of 10. If you want an all-night fire of hard coal with no attendance but draft automatically controlled, use 8 as a divisor. In the above estimates the area of smoke stack is to be one-eighth the area of grate, with an addition fro friction of 4 inches.

To ascertain the size of steam boiler required, divide the surface by 30. This will give you the number of square feet of heating surface that the boiler should contain. If a hot water boiler is to be used, divide by 50.

For radiation in lineal feet one-inch pipe, steam, divide the surface by 2. These are not given as hard and fast rules, but as the result of an individual experience, to be improved upon as other experiences may suggest, and as a practical illustration of how estimates for heating may be made on a scientifically correct basis, rather than on one that is evidently wrong, and when broadly applied and extended is found to be worse than useless, since it is misleading.

The bottom of the whole business or profession in making estimates for the heating of buildings of all descriptions lies in obtaining correct co-efficients for the heat and cold resisting value of the surfaces of which the construction is composed and a proper adjustment of the same to the locality wherein the building is situated.

Is Toronto's By-law Antiquated?

Editor "Contract Record":—

Sir,—There is probably no other city of any size on the continent where so small a proportion of the building permits are for reinforced concrete structures as in Toronto. A stranger coming from any of the American towns and looking over our building operations would think we are behind the times. He would be unable to account for the very general lack of evidence of appreciation of this most modern development in fireproof construction in any other way.

As a matter of fact we are not behind the times. The architects of Toronto are as intelligent as any that can be found anywhere, and the business men are as ready to adopt new methods.

The fault of all lies in our building by-law. The original draft of the provisions regarding reinforced concrete was evidently written at a time when this type of construction was little known and less understood. The intention was to prevent our citizens from investing in any type of construction until the same had been demonstrated to be absolutely safe. The compilers of the law themselves were evidently somewhat at a loss to determine what would be a safe structure, as is shown by an examination of some of the clauses.

For example, the law directs implicitly the method of making calculations for the design. It requires that detail drawings and specifications shall be filed with the City Architect and permission to erect will only be given in case the prescribed methods of calculation are complied with. After the building is completed it will be tested with a load equal to three times the assumed safe load, and if it doesn't stand the test the permit to erect will be withdrawn. The anxiety on the part of the lawmakers lest they might need at some time or other to "save their faces" is obvious.

There is no need of such anxiety to-day. Reinforced concrete has reached the point where it is almost, if not quite, an exact science. Opinions of different engineers vary somewhat as to what proportion of the ultimate carrying capacity of a beam or column shall be regarded as safe, but if asked to predict the actual breaking load the different methods of calculation will not vary more than ten per cent. The actual tests will have as much range as that. The breaking strength of wood beams of the same kind of timber will vary much more, yet we never think of placing test loads on wood beams.

The defects in the present by-law are obvious to any engineer acquainted with this class of construction. Take, for example, the data to be used in the design of columns. The type of column intended in the by-law is a square one of concrete reinforced with vertical steel rods. Both the steel and the concrete carry the load. The case is exactly similar to a heavy spiral spring, inside of which is placed a lighter spiral spring, with a load resting on both of them. The load would be divided between the springs in proportion to their relative ability to "buck up." The load is divided between the steel and the concrete in a column in the same manner

The mathematical expression of the ability of material to "buck up" is called the modulus of elasticity. The by-law provides that the ratio of the moduli of elasticity of concrete and steel shall be assumed as one to twelve, in other words, the stress per square inch on the steel shall be assumed as twelve times that on the concrete. Then in the table of safe working stresses it prescribes 350 pounds as the safe stress per square inch on concrete, and 12,000 pounds as the corresponding figure for steel. The ratio between these is as one is to 34 instead of 12. As a matter of fact in standard practice the unit stress in concrete in columns varies from 450 to 500 pounds and the unit stress in steel is never over 10,000 pounds, and generally less. The figure given in the by-law is standard practice in structural steel design, but not in reinforced concrete.

A similar difficulty arises regarding the design of beams. It is generally known among engineers that the behavior of a reinforced concrete beam under test is radically different from a steel beam. As soon as the steel in the latter begins to stretch badly the beam sags but does not break until a much greater load is reached, in fact, the metal in the botom flange may actually be pulled in two. This is by no means the case in a concrete beam. As soon as the steel stretches to any great extent the concrete cracks and begins to spawl off at the top and the whole structure fails. The point at which the steel begins to stretch badly is technically known as the elastic limit of the material, and is at about half its ultimate breaking strength. Now, by long experience in the design of steel beams, the use of one-quarter the ultimate breaking strength, or half the elastic limit, as a safe load on steel has been found to be satisfactory. This, for structural steel, is 16,000 lbs. per square inch. For building construction this practice is universal, although it is reduced for bridge work. It is not satisfactory, however, for concrete. If the quality of steel intended in the by-law is used the beam will actually break at twice its safe working load. In other words, it will have a factor of safety of two.

Engineers nowadays get over this difficulty regarding the low unit working stresses permissible in the steel used in concrete reinforcement by using special steels with very high elastic limits. They generally consider the safe stress of this material as one-third the elastic limit, instead of one-half, as is the obvious intention of the building by-law.

The safe tensile stress for steel given in the by-law is, like the safe compressive stress, taken from standard practice for all steel structures, and it does not apply. In justice to the compilers of the law it should be stated, however, that this error is a very common one even yet. Owing to the paste-pot-and-scissors methods used in making most building by-laws this error has been copied from one city to another, until it has grown hoary with age and has attained great respectability. On the American Pacific coast, where, owing to the demonstration of the 'Frisco fire, reinforced concrete has attained its greatest development, this error is eliminated and by-laws in other cities are not generally enforced in this respect.

The by-law directs a test equal to three times the safe working load. The obvious intention is to guarantee the customary factor of safety of four. Such a test would entirely wipe out the factor of safety for the assumed live load and would make a serious inroad into the factor of safety for the weight of the construction itself. Assuming that the prescribed methods of making the calculations are correct, the test load would be a success or a failure depending on whether the ratio of the assumed safe floor load to the weight of the actual construction was large or small. But that's another story, and too long to take up here.

The by-law as it stands does not compel strong construction. It merely makes it expensive. It compels the investor to pay a very considerable percentage more for his reinforced concrete building that he should, and instead of a strong building gives him merely an awkward one, with clumsy columns and beams, lacking efficiency. The cost is so great that for all practical purposes citizens of Toronto are prevented from using this newest and best type of fireproof construction.

Is it not about time that the provisions in our building by-law were revised to correspond with the recent developments in the science? The whole matter should be overhauled by a committee of competent structural engineers. Elasticity should be given the by-law. The behavior of steel and concrete in combination are not governed by the laws of Toronto. Knowledge of the mathematical principles governing this type of structures has increased greatly in recent years and will probably continue to increase for some time to come. Any by-law without elasticity will therefore soon be out of date, and in the words of the mail order advertiser, we ought to "do it now!" So much money is being spent here in new construction that any delay is costly. What do you think about it? X. Y. Z.

Up-to-date Sanitary Woodwork

The Goderich Organ Company, Limited, of Goderich, Ont., whose advertisement appears on page 69 of this issue, state that they are the only firm in Canada who make a line of closet seats, tanks and other sanitary woodwork in all different woods and finishes. It requires more skill and knowledge of wood to make a closet seat or tank than to make a piece of furniture, as the former are exposed to dampness and are frequently wet, while the latter is kept dry. The Goderich Organ Company, Limited, have been making closet seats, tanks and everything in sanitary woodwork for the past ten years, and have a factory equipped with every improved appliance and machine for the manufacture of this class of woodwork.

They buy their lumber one year ahead of their needs, and this is subject to special treatment until it is finally shipped out capable of withstanding moisture. They have made for their special use, a glue, which withstands water They also have a varnish made for themselves, aged, and held for shipment, thus assuring uniformity in the quality. They have always in stock for prompt shipment a large quantity of standard goods, as well as higher grade seats and tanks in such woods as natural cherry, oak, walnut and mahogany. The attention of architects is especially drawn to these goods. Catalogues will be furnished on application. This firm sell only to the jobbing trade, and export to all foreign countries, where their goods enjoy a very good reputation. They have acquired the patents and rights to manufacture the "Never-Split" seat, the joints of which are held together by iron bolts and nuts sunk into the wood, rendering it practically a "never-split" seat, as the name implies. They have also secured for Canada the patent "Keystone" seat. This seat is constructed with a taper dovetail joint, and goes together like a wedge, so that it is impossible to come apart.

These two seats make the acme of perfection in seat construction, and every seat is guaranteed to stand the severest test. The capacity of their factory is such, that they can supply the needs of Canada and half the world.

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

Concrete in Highway Bridge Abutments

By A. W. Campbell, Deputy Minister of Public Works for Ontario

Cement concrete has entered into municipal work of many descriptions, but in no field has it made itself more apparent than in bridge building and in the construction of bridge abutments. When timber was cheap and plentiful, and the country sparsely occupied, temporary structures were permissable. To-day, farm lands are being brought under a high degree of cultivation, population has become numerous, and lines of travel are fixed. It is extremely fortunate that, with the increasing cost of timber, concrete has become available. As compared with timber, its cost is not excessive; with good materials and properly mixed, concrete is absolutely permanent; and whereas timber decays and becomes weak with age, concrete becomes stronger. Appearance counts for much, and with the coming of well-designed concrete structures, the old, weak and decaying timber abutments are becoming a thing of the past.

As compared with stone masonry, concrete has advantages. Masonry requires repointing from time to time. If this were attended to promptly by councils, the matter would be of little consequence. Too often, however, it is neglected, with the result that the masonry falls into decay, and is only disturbed when complete renewal is required. Very often the stone weathers and decays, whereas Portland cement mortar, surrounding even somewhat perishable stone in the concrete, is a protection. When a stone abutment is undermined by the flow of the stream, the upper parts yield; whereas with concrete, a thoroughly united structure, there is much less danger of failure from this cause.

In the matter of cost, concrete, though somewhat more expensive than timber, is in nearly every case cheaper than stone. Concrete is frequently available where stone is impossible. Concrete is cheaper than stone largely because it can be mixed and put in place by unskilled labor; and gravel, sand and the cheaper qualities of crushed stone may be used. The effect of Portland cement is to convert the aggregates, sand, gravel and crushed stone into one single stone.

The Design of Abutments.

Abutments are usually designed as retaining walls to support the earth behind, and pressing upon them. When designed in this way and placed on a solid sub-soil, they are of ample strength to support the steel or other bridge resting upon them. Designed as a retaining wall, a concrete abutment must have sufficient weight and dimensions to resist the overturning pressure behind it when the soil is loose, wet, freezing or in any other condition. A careful study of any abutment will depend largely upon the class of earth which it is required to support.

The stability of earth in embankments is subject to atmospheric action, especially alternate frost and thaw, and depends largely on drainage. Clay retains water and becomes pasty. Sand, if in a basin of water-holding earth, becomes a quicksand and is completely unstable. A mixture of sand and clay is at times the most difficult case to deal with.

There is a certain "angle of repose" at which the tendency of earth to slip is overcome. This angle varies with different kinds of earth, under various conditions of moisture. Wet clay is troublesome, and an angle of sixteen degrees is sometimes needed to secure it. Well drained clay, however, will rest at an agle of forty-five degrees, or a slope of one to one. With average gravel and compact earth, a slope of one to one is a safe angle, although first-class gravel will retain an almost vertical face for a considerable time. Sand varies greatly, "water sand" being no better than wet clay. Dry sand needs a slope of one and one-half to one. Rules of this description cannot be laid down with complete accuracy, nor need they be closely regarded in designing a bridge abutment. The weight, however, which a bridge abutment may be called upon to sustain, is influenced by the different qualities of soil.

It is extremely important that bridge abutments rest on a strong and unyielding sub-soil. Any settlement, especially if that settlement is unequal, will tilt the bridge to a greater or less extent, and in this way the strains for which the bridge is designed may be largely altered, ending with disaster to the bridge. It is characteristic of concrete, as compared with stone, that a wide footing is more effective in increasing the sustaining power of the abutment by distributing the weight over a greater area of sub-soil. Thus rock, equal to the best ashlar masonry, will sustain 25 tons per square foot of surface. Rock equal to the best brick masonry will sustain 15 tons per square foot; rock equal to cheap brick masonry, 5 tons per square foot; dry clay, 4 tons; moderately dry clay, 2 tons; a soft clay, 1 ton; cemented gravel and coarse sand, 8 tons; compact and well cemented sand, 4 tons; clean dry sand, 2 tons; quicksand and alluvial soils, one-half ton. By taking into consideration the weight of concrete at 140 pounds per square foot, and estimating the pressure which the abutment must support from the bridge load, and the earth which it is required to retain, the necessary area of footing may be computed.

Dimensions of Abutments.

General dimensions of a bridge abutment are ordinarily such that the thickness at any point is equal to 40 per cent. of its height below the surface of the earth. This may frequently be decreased to 25 per cent., depending, however, upon the nature of the soil which is to be retained. Where abutments are over 10 feet in height, there is economy in designing them as thin walls with buttresses extending into the earth behind; these buttresses resting upon a wide concrete footing at the base, the whole being tied together with steel to take up tensile strains. The earth resting upon the wide footing at the base holds it in place, the steel framework takes up the tensile strains and resists the overturning weight of the earth pressing upon the abutment. Owing to the steel required, and the extra care necessary in construction, it is seldom economical to build structures of this class which are under ten feet in height, but this will depend largely upon the cost of concrete at the site of the building, which, in turn, depends mainly upon the distance which the sand and gravel or stone have to be hauled.

The plan of the wing walls also influences largely the design and strength of the abutment. Wing walls are intended solely as retaining walls, and as a protection from the eroding influence of the stream, especially in time of flood and freshet, and when injury from ice is to be anticipated. Where circumstances will permit, a "U" shaped abutment is desirable, where angular wings are not required to guide the flow of the stream. In this case, the wing walls project vertically backward from the face of the abutment, and are parallel with the centre line of the roadway. To obtain the natural and stable earth slope, some of the earth must fall around the footing of the wing wall, helping to sustain it. This wing wall projecting backward with a wide footing, has also an anchoring effect on the main wall of the abutment, tending to resist the overturning pressure of the earth. With the wing walls parallel to the roadway, the handrails of the bridge may be carried along it in a substantial manner, adding very much to the appearance of the bridge.

The specifications of the Ontario Highways Department for concrete bridge abutments, provide that abutments and wing walls shall be mixed in the proportions of one part of Portland cement to seven parts of suitable gravel; or one part of Portland cement to three parts of sand and six parts of broken stone. For bridge seats, 1 : 2 : 4 mixture of concrete is employed. Abutments may frequently be cheapened in cost by a judicious use of rubble stone. The specifications above referred to provide that within the body of the abutments, piers and wing walls of not less than four feet span, but not nearer than six inches to the surface in any direction, stones not larger than one man can readily lift, may be placed by hand in layers. These stones shall be in "rack and pinion" order, and not less than two inches apart. In hot weather the stones shall be dampened before placing in the concrete; or, if dirty, the stones shall be well flushed to remove the earth, loam or objectionable material. Concrete shall be carefully inserted between the stones thus placed and thoroughly packed and rammed so as to fill all voids. Concrete shall cover each layer of stones to a thickness of half the depth of the stones, when another layer of stones may be placed. A facing of fine concrete is at all times to be kept at least six inches higher than the rubble concrete, and shall be united with the rubble concrete so as to form a continuous and solid mass. This outer rim of concrete shall precede the placing of the rubble work within, and shall be placed around the interior of the casing to a thickness of six inches. It is to be thoroughly pounded so that no cavities shall remain when the outside casing is removed. In no instance is the rubble concrete to extend higher than one foot below the top of the pier, wing wall or abutment, which top of pier, wing wall or abutment shall be finished with fine concrete rich in cement. The rubble stone is not under any circumstances to extend into a coping, arch or floor.

In using rubble concrete, care should always be taken that no large stones are within reach of anchor bolts which may be sunk into the concrete from the ends of a bridge, as the concrete may, when in a green state, be broken or shattered from this cause.

The Permanence of Concrete.

Too much stress cannot be placed upon the fact that, while the permanency of concrete is dependent upon good materials, yet the usual cause of failure and imperfections is careless mixing and handling. Any recommendation which may be made as to the merits of concrete must be understood to imply a proper uniting and mixing of all materials. Difficulty frequently arises in placing concrete in the foot of an abutment or pier below the surface of the water. If a coffer dam cannot be constructed to keep out the water, a commonly employed and successful method is to use a tremie; that is, a sheet iron pipe reaching from the surface of the water to the point at which the concrete is to be deposited, and through which concrete is poured into place.

Design of Details.

In the details of bridge abutments, there is much play for good judgment and good taste. A frequent mistake is to be seen in the placing of a batter. The face of the abutment may be vertical, but the increased thickness should be made with the slope on the back, where the earth rests. This batter may be made in the form of steps by the overlapping of timbers forming the framework, and in this way the earth rests upon the abutment, tending to hold it in place. It also permits freezing and expanding earth to slide upward instead of pressing directly outward upon the abutment and tending to overturn it. A slight batter, if used on the front of the abutment, is useful chiefly for appearance, and very little strength is to be gained thereby. It is, however, helpful if the abutment is narrower at the top (across the roadway) than at the base. This coincides with a face batter of the wing wall, and gives the work a very pleasing appearance.

The surface finish of abutments is a matter of considerable importance. A perfect finish should be secured by careful work; fine material put against the inferior face of the moulds, which latter should be of dressed lumber. In ordinary work, this may be obtained by spading against the forms, drawing back the coarser material of concrete, and permitting the mortar to run against the face. To secure good results, concrete should not be too dry for this class of work. Where a substantial face is required and a good finish is sought, a false frame may be carried up inside the abutment. Between the false framework and the outer mould, fine and rich concrete may be placed to any desired thickness, say three or four inches. The false mould may then be taken out, and ordinary concrete worked up against the finer material previously put in place.

Where a steel bridge is being constructed, and under ordinary circumstances this is the case, the bridge company will supply a sketch of the design of bridge-seat required. It is preferable, of course, that a bridge be designed throughout by an independent, competent engineer employed by the municipality; in which case he will also supply the entire design for the abutment. The bridge-seat must vary in details with the dimensions of the steel superstructure. The appearance of the bridge can be enhanced by carrying out a coping on the face of the abutment. Efforts to finish a concrete abutment in imitation of stone are to be deprecated. Concrete is a material of distinctive character, and as such it is much more satisfactory to employ it frankly as concrete.

A good appearance, especially of all parts in view of the travelling public, should be sought after. The public who use a bridge and pay for it, judge its qualities almost solely by what they can see. However durable and substantial a structure may in reality be, if it has any appearance of weakness, or of careless or unworkmanlike construction, adverse criticism is certain to be made. On the other hand, if a good appearance is secured, adverse criticism is not only disarmed but much satisfaction will be felt and expressed. Appearance is not a useless thing. It indicates good design, good workmanship and is a thing in which all must feel satisfaction, and is fully as desirable in public as in private work.

A proposal for an additional charge of 50 cents per ton for weighing coal at destination has been made to the Railway Commission and has met with strong opposition from the Ontario Coal Dealers' Association.

The Testing of Lime for Building Uses

Present Methods are too Crude—Scientific Determination of Qualities Needed.—By A. G. Larsson, C.E.

Good building materials are of vital importance, not only for the safety of the public but also as a safeguard to the investor. Admitting this, the question arises, How can we obtain a guarantee that the iron, cement, brick, lumber, etc., are good and possess the desired qualities? To satisfy ourselves on this point there must be tried standards corresponding to the different materials and their use, and describing the properties of the same necessary to secure absolute safety. Tests have then to be made according to well-defined practical methods founded on these standards. By working along these lines we not only ascertain if a certain material can be used or not, but also, if different brands of the same are tested, their comparative value. This information is important, not only as a protection, but also because it enables us to use the right thing in the right place.

Our building materials are, as a rule, tested as I have mentioned above for important structures, but very little attention is paid to the lime, notwithstanding that its quality is of great importance. There are at the present time no general standards, or testing methods for lime. We generally are satisfied if it slakes well and gives a mortar acting nicely on the trowel. I think we must all agree that this is rather a crude test. Some contractors judge the qualities from the chemical analysis, but even this does not furnish the desired data or safeguard against unpleasant surprises. If the latter occurs, who is to be blamed, the man who accepted the lime or the manufacturer? Therefore, instead of depending on good luck, it should be of interest to both parties to have specifications of lime, defining the different kinds, and the tests necessary to determine the properties of the same according to the different uses. I think the best way to do this would be to form an association like the Canadian Cement & Concrete Association. It would require much work to obtain above mentioned standards, but I am sure the results would justify the enterprise. But as my intention was to suggest some tests on lime, and not to point out the necessity of an association, I shall return to the subject.

The determination of the tensile and crushing strength of lime is undertaken occasionally. The same tools and the same shaped briquettes are used as for the corresponding tests of Portland cement. The test pieces are either kept in air during the whole period of curing, or a part of the same in air and the rest in water. The former method is used for "white lime," and the latter for "grey lime" (hydraulic). There are, however, many different kinds of grey lime, depending on the amount of silicates and magnesia present. The right proportion between the air and water curing of the briquettes does vary accordingly, and this necessitates chemical analysis. The procedure is therefore rather complicated. Consequently we may ask if this method is really necessary. I am of the opinion that it is not according to the use of the lime nowadays, and that it can be facilitated. Lime-mortars are now seldom, if ever, employed for work under water, especially for important structures. They are generally used for brick-masonry, stonework and plastering, where the carbonic acid and moisture harden the mortar.

The following simple method is much better. I do not claim it is the best possible one, as this point can be decided only after extensive researches into the subject. To determine the crushing or tensile strength of lime mix well one part of it with three or four parts of standard sand (by weight), add the water necessary (about 11 or 12 per cent.) and incorporate it thoroughly. Mould the briquettes as usual, either with the fingers or the trowel. The latter gives the highest results. If tensile tests are made the moulds can be taken off immediately, but they should be left on the cubes intended for crushing 24 hours. The briquettes are stored in a thermostat the entire length of the curing period. The temperature should be kept fairly even.

The hardening process of the lime is due to one or both of the following reactions:

1. The hydrate of lime absorb as carbonic acid from the air. The process is most active when the mortar is moist (at least 1 per cent.).
2. The hydraulic constituents in the lime combine with water.

The water plays, therefore, an important part in the hardening process. A plate or beaker with water is placed in the thermostat to prevent the air from drying out the briquettes. The period of curing should last at least 28 days. To test for shorter periods is of no use, as the results obtained will prove irregular, but 28-day tests carefully conducted will show satisfactory uniformity. This way of testing has the advantage of the first mentioned, where water curing also was employed, as it is more simple and general for all kinds of lime. Besides that, it conforms more closely to the actual use of the lime. It will, for these reasons, give more reliable and comparable results.

The quality of the sand should also be taken into consideration when preparing mortars. A sharp, coarse, clean sand is the best. A dirty sand, besides giving a weak mortar, may also cause disintegration, and what is commonely called "salt petre." Therefore, the sand employed should be carefully selected. It should also be mixed in different proportions with the lime to be used, and that mixture selected which gives the desired strength.

Below are some figures illustrating how different results may be obtained from different kinds of sand. We see from them that the Berlin sand gives even in a poor mixture a higher strength than either of the other two. It would, therefore, be wrong in this case to use the same mixture for the Elbe sand as that which had proved necessary for the Berlin sand.

Kind of Sand	Proportions		Strength	
	by Vol.	by Weight	Tensile Strength 28 days lb. sq. in.	Crushing Strength 28 days lb. sq. in.
Standard sand	1: 5.8	1: 4	42.6	220.1
Elbe sand	1: 6.9	1: 5	46.7	191.7
Berlin sand	1: 8.8	1: 7	62.5	230.0

The lime was hydraulic. The test pieces were stored 5 days in air and 23 days in water.

The slaking of lime is a chemical reaction in which water is absorbed Lime + Water = Hydrate of Lime. The process is accompanied by an increase of volume, which for the best kinds of white lime can amount to 3.5 times;

when making estimates we generally figure 2.6 times expansion. (The real increase, or the increase on account of the larger hydrate mol. is, however, only about 1.49.) The more impurities the product contains the less will be its increase in volume by hydration, and as a rule more of the same has to be used to make one cubic yard of mortar. It is therefore to the contractor's interest when buying, besides determining the strength, to find out the yield of lime-paste of the different brands that can be purchased. The product giving the most paste is preferable, everything else being equal. When, however, comparing white lime with grey or hydraulic, it must also be taken into consideration that the latter is stronger, even if the former gives more hydrate. I have seen buildings in and around Owen Sound, Ontario, where the mortar prepared from grey lime compared favorably with such made from the Rosendale cement.

The examination and testing for "dead matter" should also be made. I mean by this term those pieces that do not slake in about two hours. They are, besides being useless as cementing material, dangerous, as they very often slake after mortar is put in place and, of course, then cause cracking. To determine the comparative yield of paste and the amount of "dead matter" in quicklime I would propose the following method: Crush the sample to small pieces and use in the test 10 pounds of what stays on the sieve No. 4 and passes No. 1. Add to above sample one gallon of water and when the slaking begins add two gallons more. Let it stand two hours, and then weigh the paste, after which stir up and sieve through No. 30. What stays on the sieve may be considered "dead matter." Determine the weight of one gallon of paste from the figures now obtained and the amount of paste from ten pounds quicklime.

$$V = \frac{P - r}{p}$$

P = 1-lb. of thin paste from 10 lbs. quicklime.
V = 1 gal. of thin paste from 10 lbs. quicklime.
r = 1 lb. of "dead matter" from 10 lbs. quicklime.
p = Weight of 1 gal, of thin paste in lbs.

1 gallon of paste is emptied into a bag (made from same material as used in filter presses) of globular shape and is, after the sack is tied up, exposed for 3 hours to a pressure of 200 lbs. A part of the water is thus driven off. The weight of the remaining paste is taken, and also that of 1 gallon of the same by weighing 1 quart. From these results we find the amount of stiff paste that is gotten from 1 gallon of thin.

$$V = \frac{P_1}{p_1}$$

V = gallons of thick paste from 1 gallon thin.
P_1 = lbs. of thick paste from 1 gallon thin.
p_1 = lbs. of 1 gallon of thick paste.

The yield of thick paste from 10 lbs. of quicklime therefore equals $V \times v$ gals.

The figures thus obtained will enable us to compare different brands, even if the tests are made in different localities and by different persons. A lime showing the best yield, examined as above, will certainly give the most mortar at the job. The following table shows the results of tests of two limes on the market.

	Dead Matter per cent.	Yield of Stiff Paste per 1 bu.
A	0.12	2.48 cu. ft.
B	9. 7	1.70 cu. ft.

The above method is worked out to suit the conditions in this country. I have in preparing the same taken into consideration the extensive researches made on the subject by Prof. Gary and Prof. Cramer, Germany. I do not claim that it is perfect, but rather an attempt to obtain a general method for testing lime used by the builder. I publish it to arouse others interested in the subject to further investigation. I have found that, as a rule, the samples submitted for testing by the contractor are too small to carry out about described tests. In cases of this kind I employ Prof. Steingraber's method.

Below is a table showing the chemical analysis of some commercial quicklimes. The first five represents white lime and the remainder are examples of grey lime. No. 6 and No. 7 owe their hydraulic properties to the pressure of silicates, and Nos. 8 and 11 to the high percentage of magnesia.

SiO_2	Al_2O_3 $+ Fe_2O_3$	CaO	MgO	Mv	Analyzed by	Locality
p.c.	p.c.	p.c.	p.c.	p.c.		
2.07	0.26	96.08	0.25	....	Author.......	Ontario
2.85	0.30	95.37	0.18	....	Author.......	Alberta
2.80	1.74	94.92	1.08	....	Author.......	Ontario
2.90	1.82	93.43	1.24	....	Author.......	Ontario
0.89	1.01	91.09	....	5.31	Prof. Cramer..	Germany
7.30	3.67	87.81	0.67	....	Author.......	Ontario
14.19	5.40	80.00	trace	....	Author.......	Germany
2.15	1.08	82.99	13.00	....	Publication...	Manitoba
2.02	2.22	58.85	36.80	....	Author.......	Ontario
4.40	1.18	55.97	37.06	....	Author.......	Ontario
2.50	2.56	57.30	37.80	....	Author.......	Ontario

The difference in strength between white and grey lime is shown in the following table by Mr. G. V. Rhines:

Age.	White lime	Magnesia lime.
8 weeks	36.4 lbs. sq. in.	28.8 lbs. sq. in.
3 months.........	39.3 lbs. sq. in.	37.1 lbs. sq. in.
4 months.........	39.0 lbs. sq. in.	51.0 lbs. sq. in.
6 months.........	50.8 lbs. sq. in.	83.0 lbs. sq. in.
12 months.........	44.6 lbs. sq. in.	92.8 lbs. sq. in.

The mixture was one part of slack lime to two parts of sand.

"Metal Industry" describes the metallizing or copper-plating of wood as follows: The wood is first coated with two or three very thin coats of orange shellac, prepared by dissolving two ounces of shellac in one pint of wood or denatured alcohol. This coating protects the wood from the action of the solution used in the process. When the shellac is thoroughly dry apply a very thin coat of turpentine, copal varnish or hard oil finish. Allow to dry for a short time; when "tacky," dust over a coat of copper bronze powder with a camel's-hair brush, care being taken to completely cover the wood with the powder. A second application should be made with a stiffer brush, so that the coat becomes perfectly smooth. The wood, when perfectly dry, is then ready for plating. Make up a solution of sulphate of copper, two pounds; sulphuric acid, four ounces, and water, gallon. Dissolve in hot water and allow to cool. Use anodes of pure copper.

The brickyards at West Toronto report a strenuous time filling the builders' and contractors' orders that are pouring in. It is expected that the building trade in West Toronto this spring will beat all records. George H. Townley & Company have re-leased the Townley brickyard, and have also leased ten acres of clay from the Silverthorn estate, upon which they will put a brick plant.

A Progressive Concrete Machinery Company

The London Concrete Machinery Company, of 19 Marmora street, London, Ont., has within the last year been incorporated with a capital of $100,000 for the purpose of extending the business, which is now a large one. The private company was organized by the present president, Mr. Henry Pocock, and has been in existence for the last three years, being brought up to its present size under his management.

The new company, of which Mr. Pocock is president, is composed of several citizens of London, Ont., all of whom are well known business men, who are making it a principle of their business to manufacture the highest type of machines and moulds possible. An hour spent in their new offices, srow rooms and factories is most interesting, as the company produces almost every conceivable device in the concrete machinery line.

The business for the year 1909 up to the present has been, they state, about six times as large as that of 1908, and although large and commodious factories and warerooms were erected last year, the business has already outgrown the premises and the company assert that they have found it necessary to have a large portion of their machines manufactured in other shops in order to supply the demand. They are now preparing plans for large additions, which will be eercted during the present year.

Their machines and moulds are now well known throughout Canada. Besides catering to the contractors, they have done a very large business with municipalities with their culvert and sewer pipe moulds. Many municipalities now purchase their own moulds and make cement tile on the ground, as it is believed that a considerable saving is thus effected on the price at which it can be produced. It is also claimed that they can be laid in their place in a better condition that it is sometimes possible to do when they are shipped from a distance.

The London Block Machine.

A description of some of this company's machines will no doubt interest many readers. The London face-down combined adjustable concrete block machine, which has only been placed on the market about two years, has a wide reputation. This machine makes all blocks face-down, which allows a rich and fine material to be placed on the face of the block and the back of the block can be made of coarser material. Some of the advantages claimed for this machine are as follows:

The core is placed in horizontally, but withdrawn vertically after the block has been discharged, allowing the block to be made under what is known as the wet process.

One very important feature is that this machine will make with the same mould and on the one width of pallet, blocks for any width of wall, it not being necessary to purchase different moulds, but simply adjust the machine.

Any size of core opening can be made in the block. This fact is greatly appreciated by architects and engineers, as many of them have been prejudiced against the concrete block on account of not being able to secure blocks which would meet their requirements. By placing either a large or small core within the block as desired by the architect, much better results can be obtained, as the crushing strength of a structure all depends upon the portion of the block which can be used as a bedding surface.

The London Concrete Mixer No. 1 has only been on the market about ten weeks, and already a large number of sales are reported. This firm have several other types of concrete mixers, but the London No. 1 is designed to meet the requirements of a certain class of contractors who up to the present, it is claimed, have not been able to secure the machine they required for certain classes

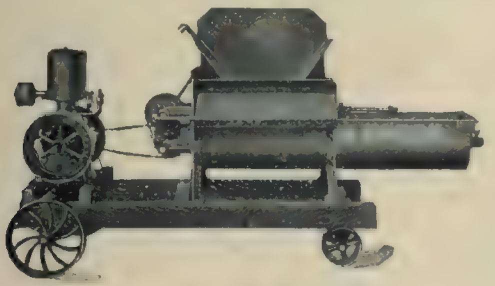
H. Pocock, President of the London Concrete Machinery Company.

John C. Doidge, Secretary-Treasurer, London Concrete Machinery Company.

E. Hodgert, Sales Manager of the London Concrete Machinery Company.

of work. The London firm state that, after looking over the field, they found there was a demand for a concrete mixer which would have a capacity of 40 yards per day, or less as desired, down to about 10 yards. Such a machine could be operated on small jobs by one man, or could be set to a larger capacity and thus meet the requirements of a contractor, not needing a capacity of over 40 yards per day. To meet this want No. 1 was designed, and President Pocock says its success has been most gratifying. He gives the following description of it:

"The London No. 1 is an automatic continuous batch mixer, that is to say, it automatically measures the material in batches, thirty batches being measured per minute, each batch being exactly the same size according to how the machine is set. These small batches are deposited into the mixing trough below, where the materials are thoroughly mixed, first in the dry state. They then pass forward under a spray pipe and after receiving the water are thoroughly tempered. Any consistency of moisture can be given. Any proportion of mixture can be given, from 1 to 1, to 1 to 50, and the machine can be set to give a capacity anywhere from one yard per hour to four yards per hour.



London Concrete Mixer No 1.

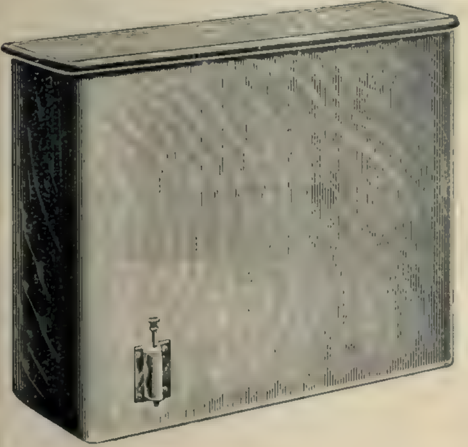
"Any intelligent contractor," says Mr. Pocock, "can very soon figure out how much this machine will save him, rather than mixing by hand or with the old style batch mixer. With this machine all you have to do is keep the hoppers full and the machine will do the mixing, thus doing away with all wheeling, scaffolding and extra shovelling."

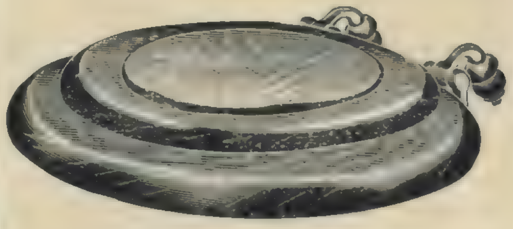
The firm also manufacture another mixer of the same type, called the London No. 2, which mixes any three materials at once and has a capacity up to 180 yards per day.

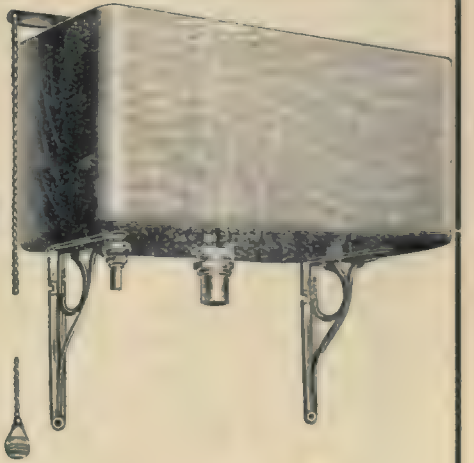
In addition to the above mentioned machines they manufacture cement working tools of all descriptions, cement brick machines, drain tile machines, window sill, lintel and step moulds and a full line of concrete machinery. They have recently issued one of the largest and most elaborate descriptive catalogues yet produced, covering concrete machinery. They ask the "Contract Record" to state that a copy will be mailed to any municipality or contractor in Canada who will write for it, stating the particular line in which they are interested.

Mr. Pocock makes a practice of giving expert information in the concrete line on any subject, without charge, and he finds a wide demand for this service.

A correspondent states that the new dam above the Chaudiere Falls has already given good results and that the scheme of storing the waters of the river in its upper reaches, which has been inaugurated by the Dominion Government, will undoubtedly produce in the course of a couple of years a marked improvement in the low water conditions of the Ottawa river.







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LEGAL DEPARTMENT

Information for this Department is requested from Architects, Engineers, Contractors and Builders. Send in the particulars of recent cases in which you were interested, giving the main facts tersely.

Payment for Engineer's Services.—Moore v. the Township of March was an action brought by an engineer, who had been employed by the municipality to report upon a scheme for the improvement of the Carp river, for remuneration for services rendered and expenses in that connection. In the course of the hearing it was decided that it is an engineer's right to delegate to qualified assistants matters of detail, such as the taking of levels, the preparation of plans, and other clerical work requiring expert knowledge but not involving the exercise of judicial discussion. As far as the latter is concerned it must be the judgment of the engineer himself, who must make personal examination of the property and himself devise the methods of improvement and decide upon the assessments. Another question arose out of the fact that the particular assistants to whom the plaintiff delegated the work were men who are regularly employed by him on monthly salaries, qualified as civil engineers, but in training under the plaintiff while preparing to qualify as provincial land surveyors. The plaintiff claimed to charge for their services at $5 a day, as the amount usually charged by an engineer. The defendants contended that he could charge no more than the proper proportion of their monthly salary, there being no more actually disbursed by the plaintiff in respect of their employment. The court decided that plaintiff was entitled to charge for the services of these assistants just what their services were worth in each case, a question to be decided upon by further evidence. The usual engineering charge was one criterion of the value of their services, but it might be shown that any one of these men was worth either more or less than the average engineer. Engineers were like other professional men in this respect, and there should be no difficulty in finding out what their services were worth. Their monthly salaries might be some evidence of their worth, but not conclusive, if they were in a sense students or apprentices under the plaintiff. It was held that the engineer has the right to delegate parts of the work, and can charge for his delegate upon the same principle as for himself, though not necessarily as much as for himself. In this case no amount was fixed by the terms of employment, even for the plaintiff himself, and it became a matter of what the work was worth. The trial was adjourned for the taking of further detailed evidence.

Inefficient Water Supply.—An interesting decision was recently given in the Superior Court of Quebec in the case of Belanger v. the town of St. Louis and the town of St. Louis v. the Montreal Water & Power Company, the actions being joined for proof and argument. Under an agreement with the town the company contracted to supply sufficient water for all purposes, and in case of fire to furnish streams 75 feet in height. Some time ago a fire occurred and, owing entirely to the absence of pressure, Mr. Belanger's store and factory were burned down at a loss of over $27,000. It was contended by the plaintiff that not only the company but the town was to blame on account of the steam pump engine being out of repair. The town pleaded that it was not obliged to pass by-laws for the acquisition of steam engine pumps, nor to provide for the organization of a fire department, nor to pass contracts for the protection of its ratepayers from fire. Under the charter of the town provision was made for the protection of its citizens and it was not thereby liable for damage by fire. The company also denied responsibility and denied any obligation to protect the plaintiff. In the decision, the plea of the town was established and the action against it dismissed with costs. The plaintiff was given judgment against the Montreal Power & Water Company for $16,112 with interest and costs.

Contracts Vitiated by Requirement of Brick of Certain Brand.—In an action by an American brick company against a surety company, involving the validity of certain contracts relative to the paving of certain streets, the United Ctates Circuit Court says that the brick were all the same, manufactured at one plant and known as vitrified paving brick of a certain brand, and covered by a trade mark. The evidence showed that the plaintiff made a brick like scores of others made, neither better nor poorer; but no one made the brick with the particular name. Of course, the name or brand or trade mark counts for nothing, because, the quality of the bricks only are to be regarded in paving, both as to the abutting lot owners and those who travel over the streets. But under these contracts other brick equally as good and equally as cheap were shut out by a cunning, but stupid, device. It was said that the statute, which required protection to the public and lot owners, was complied with; but it was not so. No one but those with whom the plaintiff would deal was allowed to bid or compete. Nor could any other plant manufacture like brick, as to brand, or like quality, of like brand because that would be an infringement of the trade mark; so that, instead of the fact that the plaintiff's brick, as to brand, being covered by a trade mark aiding it, the fact of the matter was that the trade mark aggravated and intensified it, because it thereby corrupted the transaction. The evidence showed that the plaintiff took the initiative in these illegal contracts. It employed solicitors to obtain the preliminary petitions. It obtained the signatures on which the council acted. It was a party to the entire scheme, and that scheme was an illegal one, cutting off competition. The so-called bidding was but a pretense, or, if more than that, otherwise only bidding as to such brick as could be obtained from the plaintiff, and no one else.

Mechanics' Liens.—High River Trading Company v. Anderson and joint actions to enforce mechanics' liens were recently brought in the Alberta Court. Judgment was given in favor of the lien-holders, and in the finding it was established that two of the plaintiffs who were merely superintendents of the work of construction were as such entitled to a lien. An Ontario case was cited where an architect had been found entitled to a lien for preparing plans and specifications and superintending the construction of a building.

Recovery of Mortgaged Cement Plant.—In the case of Shortreed v. the Raven Lake Portland Cement Company, the plaintiff has been given judgment for the recovery of the chattels and plant removed by the defendants from their premises upon which the plaintiff held a mortgage. In case of disagreement as to what articles are specially covered by the mortgage the plaintiff will be given leave to bring the action for the articles in dispute.

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These qualifications for the hard service which railroad structures demand apply with equal force to manufacturing plants and other commercial buildings, even where the roofs are continually exposed to steam and acid fumes.

The cost of roofs laid according to The Barrett Specification is much less than metal, asphalt or ready roofings, service considered. In fact, the cost usually figures down to less than one-fourth of a cent per square foot per year.

To anyone interested we shall be glad to send booklet covering the subject which includes The Barrett Specification in full.

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Belleville, Ont.

The construction of a number of sewers is contemplated. The money will be raised by an issue of debentures.

Calgary, Alta.

Engineer Childs has completed his report on proposed gravity water system and estimates the cost at $290,090, exclusive of reservoir.

Cranbrook, B.C.

The ratepayers have approved a bylaw to raise $10,000 for street improvements.

Claresholm, Alta.

The bylaw to raise $74,000 to install a water and light system will be submitted to the ratepayers shortly. If the bylaw carries, the town will install a gravity water system.

Chilliwack, B.C.

The ratepayers will shortly be asked to vote on a bylaw to raise $50,000 for construction of cement sidewalks and macadamizing certain streets.

Estevan, Sask.

The time for receiving tenders for water works system and main sewer has been extended to May 26th. Plans and specifications at office of Willis Chipman, chief engineer, 103 Bay street, Toronto; chief engineer's branch office, Winnipeg, room 47, Canada Life Building, and at the office of L. A. Duncan, Secretary-Treasurer, Estevan.

Fernie, B.C.

The ratepayers have approved a bylaw to raise $100,000 for the purchase of the present waterworks system and extensions thereto.

Kingston, Ont.

The Board of Works have decided to build six macadam roads.

Lethbridge, Alta.

The ratepayers have approved a by-law to provide $3,000 for construction of plank sidewalks.

Moose Jaw, Sask.

At a recent meeting of the county council, a bylaw was introduced to raise $40,000 for the construction of a reservoir at Snowy Springs, and for improving the means of bringing the water to the city.

Montreal, Que.

The Roads Committee have sent in requisitions for $2,500,000 for public work, to be completed this summer. Included in this amount are pavements, $1,000,000; sidewalks, $500,000; sewers, $133,000; pumping plant, $55,000.

Niagara Falls, Ont.

The ratepayers have approved a bylaw to raise $1,800 for the construction of a low level sewer on Main street, and have defeated a measure to raise $8,000 for sewer extension on Huron street.

Peterborough, Ont.

Tenders will be received by S. R. Armstrong, secretary, Water Commisisoners, until June 14th, for the manufacture and installation of one or two pumping units of capacity of 3,000,000 Imperial gallons each per 24 hours, and waterworks pumps, with turbine water wheels, etc., complete.

Quebec, Que.

The City Council contemplate the expenditure of a considerable sum in street improvements this season.

Stamford Township, Ont.

Tenders addressed to J. E. Jones, Township Clerk, Box 201, Niagara Falls South, will be received until May 21st for construction of concrete walks, section 2. The work comprises about 42,000 square feet of concrete sidewalk, four feet in width, and about 2,000 lineal feet of concrete curbing for same. Plans and specifications may be obtained at office of Township Engineer, J. C. Gardner, Logan Building, Niagara Falls, Ont.

Taber, Alta.

An agreement has been reached between the C. P. R. and the council by which the railway company agree to supply the necessary water from their water main to supply a waterworks system throughout the town. The town must put in their own laterals and high pressure tank. A bylaw will be submitted to the people shortly and it is expected will be carried.

Toronto, Ont.

The Board of Control will take tenders for the construction of a sewer system in Deer Park.

The paving of portions of Clifford, Berryman, Dufferin streets, Highland and Atlantic avenues is contemplated at a cost of about $27,000.

The ratepayers will vote on June 5th on a bylaw to raise $466,000 by debentures for improvements and extensions of the waterworks. $275,000 of this amount is required for the installation of electrical pumps at the main pumping station and high level pumping station. The remainder, $191,000, is to provide for laying down water supply mains and connecting mains.

Vancouver, B.C.

In connection with the five miles of concrete walks to be constructed, the following tenders were received by the Board of Works: D. G. McKenzie, 15 cents for six-foot walks and 16 cents for eight-foot walks; Lawrence & Hull, 13½ cents; H. F. Jahn & Company, 14 3-10 cents; Clinton Construction Company, 13½ cents; Concrete Engineering & Construction Company 14 45-100 cents; Scott & Ledingham, 12 cents. The price paid two years ago was 15 cents per square foot. For grading streets only one tender was considered—that of Angus Morrison, whose prices, per lineal foot, ranged from 20 cents to 99 cents, according to the streets on which the work was to be done.

Westmount, Que.

The City Council will consider a bylaw to authorize a loan for macadamizing and paving roads, construction of drains and main sewers, granolithic sidewalks and brick crossings.

Winnipeg, Man.

C. J. Brown, City Clerk, gives notice of the city's intention to carry out a schedule of local improvements, including construction of plank walks, asphalt pavements and sewers.

AWARDED.

Brantford, Ont.

The contract for the installation of a water plant for the golf club has been awarded to Goold, Shapley & Muir at $1,200.

Berlin, Ont.

The following tenders were received by the Water Commission for black and galvanized pipes: Liphardt Bros. — ½-inch, black, $2.70, galvanized, $3.73; ¾-inch, black, $3.40, galvanized, $4.55; 1-inch, black, $4.80, galvanized, $6.40; 1¼-inch, black, $6.60, galvanized, $8.90; 1½-inch, black, $7.90, galvanized, $10.70; 2-inch, black, $10.50, galvanized, $14.10. M. Weichel & Son — ½ inch, black, $2.95, galvanized, $3.90; ¾-inch, black, $3.70, galvanized, $4.75; 1-inch, black, $4.90, galvanized, $6.75; 1¼-inch, black, $6.90, galvanized, $9.00; 1½-inch, black, $8.00, galvanized, $11.00; 2-inch, black, $10.50, galvanized, $14.50. Conrad Bros. — ½-inch, black, $2.89, galvanized, $3.82; ¾-inch, black, $3.47, galvanized, $4.74; 1-inch, black, $4.90, galvanized, $6.80; 1¼-inch, black, $6.80, galvanized, $9.28; 1½-inch, black, $8.17, galvanized, $11.14; 2-inch, black, $10.89, galvanized, $17.05. The tender of Liphardt Bros. was accepted.

Hull, Que.

The contract of Carriere & Wilson for the extension of the waterworks to cost about $7,000, was confirmed at a recent meeting of the city council.

Petrolea, Ont.

At a recent meeting of the council, the tender of the Oil Well Supply Company, for sewer grates for manholes was accepted, the price to be $2.45 per hundred pounds.

Quebec, Que.

The Council have accepted the offer of the Sicily Asphalt Company to pave a portion of St. Paul street with scoria blocks at $1.50 per square yard.

Saskatoon, Sask.

J. H. Trusdale, City Clerk, states that contracts for laying water mains and sewer pipe have been awarded as follows: Section 1 to Harry Welch, Saskatoon, for $13,725; section 2 to Reginald Boulton, Prince Albert, for $17,900, and section 3 to Wm. Cook, Saskatoon, for $9,756.

Railroads, Bridges and Wharves

Brandon, Man.

The C. P. R. have plans for extensions that will cost $60,000. A double track will probably be laid between Brandon and Kenmay at a cost of $50,000 and the depot will be enlarged at a cost of $10,000.

Dalhousie, N.B.

The supplementary estimates include an item of $27,500 for the extension of the wharf at this place.

Edmonton, Alta.

The Canadian Northern Railway branch from Vegreville to Calgary will shortly be started. It is expected that the names of successful tenderers will be announced from Winnipeg in a few days. This is the first branch line, guaranteed by the local government, to be started this spring. The company must finish 125 miles this year.

Fort William, Ont.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until June 4th for the construction of wharves at the mouth of the Mission river. Plans and specifications and forms of tender may be obtained at the offices of H. J. Lamb, resident engineer, London, Ont.; J. G. Sing, resident engineer, Toronto; W. P. Merrick, resident engineer, Fort William; A. R. Decary, resident engineer, Quebec; J. L. Michaud, resident engineer, Montreal; also at the Department at Ottawa.

Hamilton, Ont.

It is stated that the G. T. R. have decided to build a four-track line from this city to Niagara Falls. H. G. Kelley, Montreal, Que., is chief engineer.

It is announced that work on construction of Hamilton & Guelph Junction railroad will be commenced this season.

Indian Head, Sask.

The council is preparing a bylaw for $25,000 debentures, to replace a number of wooden bridges with concrete.

Kamloops, B.C.

The C. N. R. has two survey parties in the field north of Kamloops, locating a route through the Yellowhead Pass. The grading outfit will arrive in September. The G. T. P. and the C. P. R. also have parties in the neighborhood of the North Thompson river.

Moose Jaw, Sask.

It is possible that the city council will come to an agreement with the C. P. R. for the erection of a high level bridge on Sixth avenue.

Petrolea, Ont.

At a meeting of the town council, Mr. James Bell, city engineer of St. Thomas, submitted an estimate showing that the probable cost of the new waterways bridge would be $4,000. A bylaw covering this will shortly be voted on.

Regina, Sask.

Hon. J. A. Calder who recently returned from Winnipeg, stated upon his return that he had obtained private assurance that the C. P. R. would build 250 miles of new lines in Saskatchewan this year.

Toronto, Ont.

Tenders will be received until June 1st by the Board of Control for reconstruction of bridges on Dundas street over the tracks of the Grand Trunk and Canadian Pacific Railways, consisting of supplying 5 new trusses of the following spans: 105 feet 4 inches, 93 feet, 86 feet 8 inches, 82 feet 8 inches, and 62 feet, and 3 new columns supporting same; new floor system; rollers, shoes, bed plates, etc., for present trusses, erection. John J. Ward, vice-chairman, Board of Control.

At a recent meeting of the Board of Works, the following motion was carried: "That the City Engineer and the Assessment Commissioner be instructed to prepare an estimate of the cost of constructing a viaduct uniting Bloor street with Danforth avenue, for the purpose of submitting a bylaw to the ratepayers."

Mr. Geo. A. Mountain, Chief Engineer for the Dominion Railway Commission, has submitted to the city officials his report upon the proposed viaduct.

The Department of Public Works asks tenders for several bridges throughout the province. (See advertisement.)

Bulk and separate tenders are invited until June 1st by H. F. McNaughten, Secretary, Department of Public Works, for substructures and superstructures for several bridges to be erected in the Province of Ontario. Plans and specifications at offices of A. L. Quartermain, architect, Kenora; A. L. Russell, civil engineer, Port Arthur; Demorest, Stull & Lowe, civil engineers, Sudbury, and at the Department of Public Works, Toronto.

The Island Committee are asking the Board of Control to provide $11,000 for a concrete bridge to replace the present structure from Hanlan Park to Turner's baths.

After a personal inspection of the various routes proposed for the eastern entrance to the exhibition, the Controllers have decided in favor of the route through the Gas Company's property, with a bridge across the tracks at Tecumseh street.

Victoria, B.C.

Tenders are about to be taken for the construction of the Alberni extension of the E. & N. Railway.

Vancouver, B.C.

Waddell & Harrington have submitted to the City Council plans and specifications for structure and superstructure to replace temporary ends of Granville street bridge as now constructed. Estimated cost $124,000.

It is stated that the C. P. R. authorities are considering the construction of a bridge over the Seymour Narrows. Recent surveys place the cost at between $5,000,000 and $6,000,000.

At a recent meeting of the Board of Works, City Engineer Clement reported that the cost of a bridge over the Ninth avenue east ravine at Glen Drive would be $7,100, of which the B. C. Electric Railway Company was to pay $3,800. It was recommended that the work proceed.

Winnipeg, Man.

General Superintendent Price, of the Canadian Pacific, states that contracts have been let for work on six branch lines in the western division, involving the construction of about 270 miles of new track. The lines include that running east from Hardisty, one east from Stettler, one north from Cheadle to Alix, one from Kipt to High River, all in Alberta, and one west from Weyburn, Sask.

AWARDED.

Guelph, Ont.

At a meeting of the Puslinch Council, the tender of Charles Mattani for the construction of concrete abutments for the Sorby bridge at $795 was accepted. The Stratford Bridge Company was awarded the contract for the steel superstructure at $1,307.

Public Buildings, Churches, Schools, etc.

Belleville, Ont.

The City Council have been asked by the Board of Education to submit a bylaw to the ratepayers for the issuing of $70,000 by debentures for the erection of new school buildings.

Brandon, Man.

The C. P. B. are planning additions to the depot in this city. Estimated cost, $10,000.

Belledune River, N.B.

The R. C. presbytery at this place was destroyed by fire last week.

Caron, Sask.

Tenders addressed to D. L. Green, Secretary Treasurer, Clay Hill school district, will be received until May 20th for the erection of school house and outbuildings.

Cranbrook, B.C.

The school house was burnt down recently.

Dundas, Ont.

Chapman & McGiffin, architects, 59 Yonge street, Toronto, have plans for the new Carnegie public library to be erected here.

East Toronto, Ont.

Tenders are asked for all trades in the erection of a Separate school building. (See advertisement.)

Glace Bay, N.S.

Tenders for fittings for the public buildings at this place close May 25th with N. Tessier, Secretary, Department of Public Works, Ottawa. Specifications may be seen at office of Daniel Ross, Clerk of Works, Glace Bay, and at the Department.

Glencoe, Ont.

Tenders for electric wiring and fittings for the post office, armory, etc., will be received until May 28th by N. Tessier, Secretary, Department of Public Works, Ottawa. Plans and specifications at office of J. E. Hall, Clerk of Works, this town, and at the Department.

Kamloops, B.C.

The ratepayers have defeated a bylaw to raise $25,000 for the erection of a new city hall.

Montreal, Que.

Funds are being raised for the erection of the Carmichael Memorial Church.

Moose Jaw, Sask.

Tenders addressed to H. B. Pickett will be received until May 22nd for the erection and completion of a new Anglican church. Plans and specifications at office of Reilly & Clemesha, architects, Regina, and at Mr. Pickett's office, Moose Jaw.

North Sydney, N.S.

Tenders will be received until May 20th for the construction of a stone church for St. Joseph's parish, North Sydney; also for a steam heating system. Harris & Hornton, architects.

Ottawa, Ont.

The building committee of the Separate School Board recommend the erection of two new four roomed schools, one at Hintonburg and one at Bayswater.

Oshawa, Ont.

Tenders addressed to P. H. Punshon, Secretary, Board of Education, will be received until May 21st for erection of new high school building. Plans and specifications may be seen at office of Town Engineer, or at office of the architects, Ellis & Connery, Manning Chambers, Toronto.

Ottawa, Ont.
Architect Ewart has submitted to the Board of Health plans for the proposed changes in the isolation hospital. Estimated cost $12,000.

Owen Sound, Ont.
D. M. Butchart, G. A. Ross, J. G. Hay and G. P. Creighton are interested in a proposition to organize a company capitalized at $10,000, for the establishing of a business men's club and the erection of a building.

Peterborough, Ont.
The Free Methodists, of this city, have purchased a site on Aylmer street, where they will erect a church in the near future.

Saskatoon, Sask.
A. W. Cassidy, who was awarded the contract for building the new $50,000 school, discovered, after signing an agreement to build, and commencing excavation operations, that he had made a mistake of $10,000 in his estimate. His amended tender is $53,569, which is still the lowest. The work is at a standstill awaiting a meeting of the school board.

Strathcona, Alta.
The Dominion Government has completed the purchase of post office and armory sites.

St. Thomas, Ont.
A new wing will be added to the registry office at an estimated cost of $6,600.

Sydney Mines, N.S.
Tenders have just been taken for an 8-roomed fireproof school building. D. C. McDonald is secretary of the School Board.

Toronto, Ont.
The Western and Grace hospitals are considering a plan for amalgamation. Preliminary sketches for the extension of the Western hospital in this connection are being prepared by E. J. Lennox, architect.

The City Council have adopted the bylaw to provide $80,000 for an addition to the Kent school.

The congregation of the Yonge Street Methodist Church will erect a new church on Summerhill avenue.

Chapman & McGiffin, architects, 59 Yonge street, have perpared plans fpr the proposed Rosedale Presbyterian Church.

The Property Committee of the Board of Education have approved plans for the extension of the Harbord street school and recommend that the Board advertise forthwith for tenders for the work. Estimated cost, $60,000.

The Board of Governors of Toronto University have decided to proceed at once with the erection of a new musuem building on the southwest corner of Avenue road and Bloor street. Estimated cost, $300,000.

$15,000 has been voted for the renovation of the engineering building of the School of Practical Science.

Vancouver, B.C.
The Exhibition Association will take tenders for the erection of the main building at Hastings park.

Victoria, B.C.
Tenders addressed to E. Criddle, Supervising Architect, Public Works Department, will be received until June 2nd for erection of frame school house on Lulu Island. Plans at offices of Government Agent, New Westminster; W. T. Easterbrook, Eburne; and at the Department at Victoria.

Welland, Ont.
Tenders for heating apparatus for the public building may be submitted to N. Tessier, Secretary, Department of Public Works, Ottawa, until May 28th. Specifications at office of Edgar Rounds, Clerk of Works, Welland, and at the Department at Ottawa.

Westboro, Ont.
A new Roman Catholic church will be erected here next fall or the following spring.

Winnipeg, Man.
Tenders for the installation of a steam heating apparatus for the examining warehouse in this city, will be received until May 25th, by N. Tessier, Secretary, Department of Public Works, Ottawa. Specifications with J. Greenfield, Clerk of Works, Winnipeg, and at the Department at Ottawa.

Woodstock, N.B.
Tenders are being called for the erection of a court house at Woodstock, according to plans prepared by F. Neil Brodie, St. John. Tenders close May 21st with J. G. Hartley, secretary-treasurer, Woodstock.

AWARDED.

Brantford, Ont.
The contract for the improvements to the police station has been awarded to W. J. Adams at $1,100.

Hastings, Ont.
The contract for the enlargement of the County building has been awarded to T. Manley, of Belleville, Ont., at $20,975.

Ottawa, Ont.
The contract for the construction of the grand stand at the exhibition grounds has been awarded to the General Contracting Company, Limited, of Toronto, at $77,875. Two other tenders were received, both from Courtney & Brown, of Ottawa, the amounts being $83,179 and $98,753. Mr. E. Hyde, of the General Contracting Company, Limited, states that work will be commenced at once. Mr. R. F. Eastham, superintendent for the company, will have charge of all the construction work. The steel will be ordered at once in Montreal.

Saskatoon, Sask.
The Saskatoon Concrete Company have the contract for the erection of a school house at Lake Patience.

Stratford, Ont.
The following tenders submitted in connection with the proposed addition to the Collegiate school have been recommended for acceptance: — J. L. Youngs, roofing, $535; Jos. Myers, heating, $1,531; Peter & Sylvester, plumbing, $259; J. L. Youngs, masonry and carpentering, $11,500; Jos. Myers, ceilings, $320; Jos. Myers, iron work, $72; Jas. Myers, gas piping, $29; Peter & Sylvester, stand pipes, $48; J. O. Hare, painting and graining, $573; W. Ireland, plastering, $484; Mr. Whatmough, electric wiring, $104.75; total, $15,455.75.

St. Catharines, Ont.
The contract for heating and ventilating the new St. Patrick's ward school has been awarded to John Peart, at $3,650.

Toronto, Ont.
Contracts for the Avenue road school have been awarded as follows: Masonry, Orr Bros., $22,550; carpentry, Crocker & Le Drew, $8,671; plaster, Blackburn & Sons, $1,150; painting, J. Pinnemore, $715; plumbing, Keith & Fitzsimmons, $1,213; steam heating, J. R. Seager, $2.100; sheet metal, Forbes Roofing Company, $896; structural steel, Jenks—Dresser Company, $1,045; reinforced steel, Expanded Metal Company, $675; electric wiring, Keith & Fitzsimmons, $35; total, $39,050.

Breen & Burford, of St. Catharines, have been awarded the contract for excavation work on the new wing which is being added to the Parliament Buildings.

Residences

Chatham, Ont.
Tenders addressed to Wilson, Son & Arnold, this city, will be received until May 25th for all trades in the erection of a brick veneer residence for T. Tynhurst, Charing Cross.

Edmonton, Alta.
Contractor Grant, of Winnipeg, will shortly begin the erection of an apartment block near the Parliament Buildings at a cost of $150,000.

Hamilton, Ont.
C. Bleicher has a permit for brick additions to 37 Leeming street. Cost $2,000.

Lethbridge, Alta.
D. H. Ramsay will erect a $3,800 residence on Brunton street.

Peterborough, Ont.
McKee & Weir have a permit for the erection of three brick veneer dwellings on Donegal street to cost $4,500.

Toronto, Ont.
Chapman & McGiffin, architects, 59 Yonge street, have plans for a $10,000 residence on Spadina road for G. A. Chapman, manager, Grenadier Ice Company; two semi-detached houses on Poplar Plains road for G. Long, cost $7,000 each; brick residence for H. C. Schofield, manager, Guelph branch, Dominion Bank, cost $5,000.

H. Hutson has purchased a site in Parkdale at the corner of King street and Cowan avenue, for the erection of a $60,000 apartment house.

Recent building permits include: Canadian Bank of Commerce, two storey brick bank, corner College and Dovercourt, $8,000; S. H. Chapman, two storey brick mission hall, College and Shaw, $5,000; Day & Company, pair semi-detached two storey brick stores and offices, Wilton avenue, $3,000; T. J. Allen, pair semi-detached two storey brick dwellings, College street, $4,500; Samuel Frame, pair semi-detached two and a half storey brick stores and dwellings, College street, $6,000; Love Bros., Limited, two storey brick store and dwelling, Queen street east, $5,000; St. Paul's Lutheran Church, one storey cement and stone church, corner College and Markham street, $6,000; J. C. Eaton, two storey and attic brick dwelling, Davenport road, $110,000; Bell Telephone Company, one storey and basement brick telephone exchange, Keele street, $14,000; Yonge Street Realty Company, five attached two storey brick stores and dwellings, Yonge street, $16,000; Robins Limited, pair semi-detached two storey brick stores and dwellings, Yonge street, $7,000; M. & E. Currie, two storey and attic brick dwelling, Admiral road, $14,000; Mrs. W. J. Ingram, two and a half storey brick store and dwelling, Gerrard street east, $3,000; J. S. Sharpe, two and a half storey brick dwelling, Roncesvalles avenue, $4,000; Canadian Kodak Company, four storey and basement brick and concrete factory, Adelaide street west, $50,000; Thos. Thompson, two storey brick store and hall, corner of Dovercourt and Van Horne, $3,000; W. O. McTaggart, pair two storey brick stores and dwellings, Bloor street west, $5,000; T. Pennock, pair semi-detached two storey brick dwellings, Markham street, $4,000; R. R. Matson, three attached two storey brick veneer dwellings, Concord avenue, $3,200; J. W. Brown, pair two storey brick dwellings, Christie street, $4,000; P. K. McKissack, pair two storey brick dwellings, Brock avenue, $4,000; T. A. Duggan, two detached brick dwellings, Sunnyside, $3,000; Mrs. S. J. Boddy, three attached brick dwellings, Aberdeen street, $6,200; Alfred Butler, pair three storey brick stores and dwellings, corner College and Clinton streets, $7,000; Thos. McCarty, two detached two and a half storey brick dwellings, Roncesvalles avenue, $8,000; Le Lloyd & Messeroll, two storey brick store and dwelling, and stable, corner Sproatt and Jones avenues, $3,400; Mrs. N. Thompson, two storey brick dwelling, Brunswick avenue, $4,600; G. Patterson, two storey brick dwelling, Russell Hill road, $6,000; H. N. Dewitt, two and a half storey brick dwelling, Warren road, $4,900; A. J. Peppiatt, two and a half storey brick dwelling, Sunnyside, $3,800; Wm. E. Weale, two and a half storey brick dwelling, Lansdowne avenue, $3,000; O. F. Dodge, two and a half storey brick dwelling, Westminster avenue, $4,500; H. F. Squires, two storey and attic brick dwelling, Laxton, $4,000; W. J. O'Reilly, pair semi-detached, two and a half storey brick dwellings, Beatty avenue, $7,000; Henry Salter, two storey brick veneer dwelling and a two storey brick veneer store and dwelling, corner Gladstone and Shanley, $4,000; Kemp & Prest, pair two storey brick dwellings, Shanley, $4,000; W. N. McEachern, three pair brick dwellings, Leuty avenue, $7,000; W. G. Robinson, alterations to stores and dwellings, Broadview avenue, $3,000; George Cooper, pair two storey brick dwellings, Ossington avenue, $4,600; J. Williams, two storey and attic brick dwelling, Rusholme road, $5,400; Jos. Price, two storey brick workshop and dwelling, Spadina avenue, $4,000; S. Thompson, two and a half storey brick dwelling, Sunnyside, $4,000; H. G. White, two storey and attic brick dwelling, Boustead, $3,500; Mutual Concrete & Realty Company, pair semi-detached two storey brick dwellings, Howard Park avenue, $4,000; King Bros., two pairs brick dwellings, Margueretta street, $10,000; J. T. & H. Hutson, two storey and basement brick dwelling, corner Cowan and King, street; $30,000; A. Bonisteel, two storey and attic brick dwelling, Rowanwood avenue, $5,000; A. J. R. Snow, two storey and attic brick dwelling, Balmoral, $7,500; S. Joselin, two storey brick dwelling, Sidney, $3,000; J. & T. Bishop, two pair brick dwellings, Delaware avenue, $10,000; C. W. Chadwick, pair semi-detached brick dwellings, Dovercourt road, $7,000; R. Almond, two storey brick dwelling, Indian road, $4,000; C. J. Tabor, two and a half storey brick dwelling, Mutual street, $4,500; J. & T. Bishop, three attached two storey brick dwellings, Delaware avenue, $6,000; Robins Limited, seven attached brick stores and dwellings, Agnes street, $14,000; Lillian M. Rae, two and a half storey brick dwelling, Cowan avenue, $3,600; Y. G. Coots, two and a half storey brick dwelling, Brock avenue, $3,000; W. H. Chandler, two and a half storey brick dwelling, corner Highlands and East Roxborough, $7,000; J. H. Stanford (in trust), two storey and attic brick dwelling, corner Clarendon and Warren, $9,000; McGill & Morris, pair two storey and attic brick dwellings, Fern avenue, $5,000; James Kyle, two detached two and a half storey brick dwellings, Galley avenue, $6,000; E. P. Atkinson, two detached two storey brick dwellings, College street, $6,000; James Ingliam, two and a half storey brick dwelling, Springhurst, $3,000.

Vancouver, B.C.

B. Russell will erect a frame dwelling on Tenth avenue at a cost of $4,000.

Victoria, B.C.

C. B. Sergeantson will build a $3,000 dwelling on Cook street.

AWARDED.

Collingwood, Ont.

F. E. Brown has awarded the following contracts for a $3,000 residence corner of Third and Maple streets: Stone and brick work, J. Vickery; carpentry, J. G. Peterman; painting and decorating, W. Wensley; plastering, J. Lockton; plumbing and heating, G. Henderson.

Business Buildings and Industrial Plants

Abingdon, Ont.

The mill and basket factory of Merritt Bros. was destroyed by fire last week at a total loss of $12,000.

Barnet, B.C.

Mr. A. MacLaren, president of the North Pacific Lumber Company, whose mills were recently destroyed by fire, states that the erection of a more modern mill will be begun immediately. The new mill will cost about $350,000.

Berlin, Ont.

The town is considering two new industrial propositions. One is for the establishment of a furniture factory and the other for the establishment of a factory for metal goods. The company behind the latter proposition propose to establish a $20,000 plant. Address Mayor Hahn for further information.

Campbellford, Ont.

The ratepayers have approved a bylaw granting the Trent Valley Woollen Manufacturing Company a fixed assessment of $50,000 for a period of twenty years. In return the company will make important extensions to their premises.

Edmonton, Alta.

The Saskatchewan Elevator Company, of which Mr. Peter Jansen, of Nebraska, is president, plans the erection of several additional elevators in this province.

Haileybury, Ont.

The Stahl and Cook blocks were badly damaged by fire last week.

Hamilton, Ont.

The Mills Hardware Company have purchased property on Barton street with a view to the erection of a modern block.

The Storage & Transfer Company, Limited, now seeking incorporation, plan the erection of a large warehouse on Walnut street. The provisional directors are F. Skelton, J. H. Precious, S. D. Biggar, K.C., W. E. Skelton and R. Fleming. The company is capitalized at $40,000.

Lethbridge, Alta.

The Canadian Bank of Commerce has a permit for the erection of a $35,000 bank building.

London, Ont.

The McClary Manufacturing Company is contemplating the erection of a big addition to the molding plant. The foundation will be put in within a few weeks, and the building will be completed during the winter months.

Moncton, N.B.

L. H. Higgins plans the erection of a large business block.

Preston, Ont.

Tenders addressed to H G.. Legg, architect, will be received until May 25th for erection of double brick store for T. N. Kreig.

Portage la Prairie, Man.

The Waterloo Manufacturing Company will commence building operations here at once.

Regina, Sask.

The new Prague Milling Company, of Minnesota, is stated to be negotiating for a site in this city.

St. John, N.B.

Plans have been prepared by Architect F. Neil Brodie, for the new Bank of New Brunswick building to be erected in Charlotte street. Tenders will be called for very shortly.

St. Johns, Nfd.

According to a report received at the Department of Trade and Commerce, Ottawa, from E. D. Arnaud, commercial agent at St. Johns, W. R. Hearst, of New York, has purchased 1,000 square miles of pulpwood near Hermitage Bay, Newfoundland, and will invest $10,000,000 in the production of pulp for paper. He will employ 3,000 men.

Teeswater, Ont.

Robert Trench has purchased a site on Clinton street for the erection of a skating rink.

Toronto, Ont.

It is stated that the Bank of Montreal will erect a branch bank on the site of the Yonge street Methodist church.

Denison & Stephenson, architects, 18 King street west, have plans for the new Ambrose Kent building. Tenders will be taken early in the fall.

The premises of the Rudd Paper Box Company, the Ontario Metal Novelty Manufacturing Company, and others were damaged by fire last week at a total estimated loss of $66,850.

Vancouver, B.C.

It is stated that Mr. L. Griffiths has sold to a local contractor his property on Hastings street. A six storey building will be erected on the site.

Victoria, B.C.

C. M. Cookson has secured a site for the erection of a business building.

C. H. Dickie, of Duncans, will build a lumber mill on Quamichan Lake.

The Colbert Plumbing & Heating Company will erect a new two storey building for their own use.

The Sylvester Feed Company is having plans prepared for a three storey brick building on Yates street. Work will commence at an early date.

Plans are stated to be under way for a large lumber and shingle mill on Esquimalt Harbor. The names of those behind the project have not yet been divulged.

Welland, Ont.

Mr. Schwendell, of Pittsburg, Pa., was recently in town arranging for the commencement of building operations on the tube works.

AWARDED.

Berlin, Ont.

The contract for supplying twelve stained glass windows for the Lutheran church here has been awarded to the Cloisonne

Glass Company of this town. The job will total about 900 square feet.

St. John, N.B.
The Board of Trade are negotiating with Bonnel & Hardy, of London, Eng., who are looking for a site for the erection of a large paper mill.

Toronto, Ont.
The T. Eaton Company, Limited, have just let the contract for art artistic decoration in Cloisonne cut glass around their lunch rooms. The work will be executed by the Cloisonne Glass Company, of Berlin and Toronto.

Victoria, B.C.
Finch & Finch, of this city, have purchased a site on Yates street, where they will erect a four storey block at a cost of $15,000.

Wallaceburg, Ont.
The Hamilton Bridge Works Company, Limited, Hamilton, Ont., have been awarded the contract for the erection of the steel structure of the main factory of the Sydenham Glass Company.

Winnipeg, Man.
Eustace G. Bird, architect, Toronto, has awarded to Nucross Bros., of Boston, Mass., the general contract for a new bank building for the Royal Bank. Approximate cost $200,000.

The Ogilvie Company have made a contract with the Barnett McQueen Company of Fort William, for the construction of a 300,000-bushel grain elevator to be built next the company's mill in this city.

The Carter-Halls-Aldinger Company have been awarded the contract for the twelve storey office block to be erected at the corner of Portage avenue and Main street by J. D. McArthur. The contract price is stated to be $250,000.

Haney, Quinlan & Robertson, who have the contract for the Winnipeg shops of the Transcontinental Railway, have sub-contracts as follows: Iron work, Manitoba Bridge Works; plumbing, direct and indirect heating, Cotter Bros.; mill work, Rat Portage Lumber Company; painting and glazing, Taylor Paint and Decorating Company.

Power Plants, Electricity and Telephones

Brantford, Ont.
The Machine Telephone Company have poles along the Burford road for about five miles outside the city. They will shortly have the phones ready for use.

Montreal, Que.
The City Council are considering the advisability of constructing and operating a system of underground conduits for all electric wires except trolleys. A rental will be charged to the companies whose wires will be buried.

The Saraguay Electric Light Company have offered to supply the city with street lamps at $70 per lamp.

Pembroke, Ont.
The town water commisisoners ask for tenders for electric motor and pump. (See advertisement.)

Kamloops, B.C.
The Coteau Power Company, which is developing power at Shuswap Falls, twenty-six miles east of Vernon, is negotiating with the City Council with a view to providing the city with a power and lighting service. There is stated to be considerable capital behind the company. It is said that the present policy is to develop 8,000 horse power in units of 1,000 each. W. R. Morris is the company's representative.

St. John, N.B.
The New Brunswick Telephone Company have commenced operations in the way of underground construction, which consist of laying a conduit. One section will consist of eight ducts, another seven and another six ducts. The ducts will be placed in two layers, four on the bottom, the whole being solidly encased in concrete. The estimated cost is $18,000. The plans include the laying of an underground system that will cost a quarter of a million dollars.

Swan River, Man.
The question of building a dam on the Swan river for the purpose of supplying power and light is being discussed. An engineer has been engaged to make examinations and take levels, and will report to the town council on the feasibility and cost of producing power.

St. Marys, Ont.
The site for the transforming station of the Ontario Power Commission's high tension line was selected recently by Messrs. Gaby and Acres, engineers of the commission.

Victoria, B.C.
The ratepayers have approved the bylaw to raise $153,000 for the proposed power plant.

The Vancouver Power Company, a subsidiary concern of the British Columbia Electric Company, have been granted permission by the provincial government to raise their Coquitlam dam and thereby obtain an extra 1,000 horse power.

Vancouver, B.C.
The British Columbia Electric Railway Company will immediately begin the construction of thirteen miles of tramway extensions in the eastern end of the city and suburbs. They have been granted a 40-year franchise.

The City Council recently discussed the appointment of an electrical commission and the securing of water power for the city's own use.

Options on water powers situated within fifty miles of Vancouver will be received by the city solicitor. The city is anxious to acquire a supplementary water supply for power purposes.

Tenders addressed to W. McQueen, City Clerk, will be received until May 20th for motor generator set and switchboard panel.

The provincial government has granted permission to the Vancouver Power Company to build a 60-foot dam at Coquitlam lake for power generating purposes. Work on the undertaking, which will cost nearly $400,000, will start immediately.

Vancouver, B.C.
The B. C. E. R. are authorized to spend $2,500,000 on extensions during the next year.

Victoria, B.C.
The extension of the lighting service is under consideration. Tenders will shortly be taken for fifty new street lights.

Wellandport, Ont.
Contracts will be let soon by the Dunnville, Wellandport & Beamsville Electric Railway Company, which proposes to build a 22-mile electric railway to connect these three towns. It is proposed to begin work at once. Three or four small bridges will be built, the largest to span the Chippewa creek, and one over the Twenty river. James A. Ross, Wellandport, is president.

AWARDED.

Montreal, Que.
The contract for the lighting and distributing panels for the new factory of the Canadian Spool & Cotton Company has been awarded to the Hill Electric Switch & Manufacturing Company, of this city.

St. John, N.B.
A complete Gamewell Auxiliary Fire Alarm System is being installed for the new Intercolonial Railway terminal at St John, N.B. The Vaughan Electric Company, Limited, of St. John, have the contract, and will install 53 auxiliary boxes, one main box with auxiliary attachment and also a complete terminal apparatus for their operation.

Toronto, Ont.
Contracts have been awarded by the Hydro-Electric Commissioner to the Dominion Wire Manufacturing Company of Montreal, for copper wire, and to the Ohio Brass Company, of Mansfield, Ohio, for the suspension insulators, their tender being the lowest. The electrical equipment of the protective system in the stations will be supplied by the Westinghouse Company.

Vancouver, B.C.
Boyd & Craig have the contract for grading the Hastings street extension of the British Columbia Electric Railway, which extension will cost $70,000. Tenders have also been called for the Powell street extension.

Miscellaneous

Finch, Ont.
Tenders addressed to J. R. Simpson, Township Clerk, will be received until June 1st for drainage work and construction of two culverts. Plans prepared by Magwood & Walker, civil engineers, Cornwall, Ont.

Goderich, Ont.
Tenders for gravelling will be received until May 29th by J. G. Mackay, Clerk, Bruce Township.

Montreal, Que.
Recent building permits include: H. Corbeil, ten dwellings, Chambord street, $9,000; A. Delorme, one house, Laporte avenue, $4,000; T. Beaupre, five dwellings, Chausse street, $3,500; Catholic School Commissioners, school and school house, Wellington street, $34,000; J. B. Hudon, two houses, Cartier street, $4,000; Mary Thibedeau, six dwellings, St. Timothee street, $6,000.

Moose Creek, Ont.
Tenders addressed to F. D. Brunet, Clerk, Township of Roxborough, will be received until May 24th for excavation and completion of the Tayside Creek drain.

Ottawa, Ont.
The Department of Marine and Fisheries asks tenders for illuminating oil. (See advertisement.)

Prince Albert, Sask.
On May 29th the citizens will vote on bylaws as follows: Macadamizing streets, $26,400; extension of waterworks, $14,000; lighting plant, $10,000; sewers, $9,600; streets and sidewalks, $13,000.

Saskatoon, Sask.
On May 29th the citizens will vote on several money bylaws. They include the

(Continued on page 23)

Tenders and For Sale Department

Tenders Wanted

Tenders addressed to F. Vickert will be received up to MAY 22ND, for the building of two Cement Abutments for Steel Bridge over River Nith, Blenheim Township. Plans, specifications and full particulars can be obtained at the office of

F. VICKERT, Reeve,
Princeton, Ont.
20

Tenders

Tenders (addressed to the undersigned) for all trades in connection with the erection of a four-roomed school in East Toronto for the Separate School Board of Toronto, will be received up to SATURDAY, MAY 22ND, at 4 p.m.

A marked cheque, for 10% of amount of tender, payable to the Secretary-Treasurer of Board must accompany each tender. Cheques of successful tenderers will be retained until completion of contract, others to be returned on awarding of contract.

The lowest or any tender not necessarily accepted.

Plans may be seen at the office of the Architect, Chas. J. Read, 404 Confederation Life Building, Toronto.

JOSEPH CADARETS,
Chairman Sites and Building Committee.
20

City of Moose Jaw, Sask.

Tenders For

Laying Sewer and Water Mains

Sealed tenders addressed to Alderman Matthews, Chairman, Water and Sewer Committee, City Hall, Moose Jaw, will be received in the Council Chamber, up to 8.30 p.m., MONDAY, MAY 31ST, 1909, for Labor and certain Materials in connection with laying approximately 15,000 feet of 8" tile Sewer and 6" C.I. Water Main, Manholes, Etc. The lowest or any tender not necessarily accepted.

Plans and Specifications can be seen in the office of the undersigned.

J. DARLINGTON WHITMORE,
City Engineer.
City Hall.
21

Sealed Tenders

Marked "Tenders for Bridge Construction" will be received by the undersigned at Mountain P. O. Ontario, until 12 o'clock noon on SATURDAY, THE 29TH DAY OF MAY, 1909, for the construction of

Two Re-Inforced Concrete Arch Bridges and Two Re-Inforced Concrete Piers

as the case may be, over the Castor River and McCaul Creek on the Boundary Road between Mountain and Osgoode townships, opposite the west half lot 15, con. 12, Mountain, and about eight miles from Mountain Station or Osgoode Station on the C. P. Ry.

The work to be done consists of making the necessary excavation for the construction of the two Bridges above mentioned, grading approaches thereto and the construction of wing fences.

Plans, specifications, etc., may be examined and forms of tender obtained at the following places :

At the Office of the County Clerk, Cornwall, Ont.
" " " " " " Ottawa, Can.
At the residence of John McAvoy, Dawson, Ont.
" " " Alex. Christie, Mountain, Ont.
or " " office of Magwood & Walker, Civil Engineers, Cornwall, Ont.

The lowest or any tender not necessarily accepted.

(Sgd) ALEX. CHRISTIE,
'Commissioner."

Mountain, Ont., April 22nd, 1909.
20

Proposals

The City of Toronto will shortly call for tenders for the laying of about 300,000 duct feet underground conduit.

For specifications, apply to the Electrical Department, City Hall.
tf

Tenders

Sealed tenders addressed to the undersigned and marked "Tenders for Sewage Disposal" will be received up to noon on FRIDAY, MAY 21ST, for the building of a

Sewage Disposal Plant

for the City of St. Thomas

Plans and specifications can be seen and blank forms of tender obtained at the office of the undersigned. A marked cheque payable to the Treasurer of the City of St. Thomas for $500.00 must accompany each tender as a guarantee of good faith.

JAS. A. BELL,
City Engineer.
20

Water Works Plant

Peterborough, Ontario, Canada

Sealed Tenders will be received by the undersigned up to MONDAY, THE FOURTEENTH DAY OF JUNE NEXT, at noon, for the manufacture and installation in place of one and two pumping units of three millions imperial gallons each per twenty-four hours, with turbine water wheels, etc., complete.

Specifications can be obtained at the office of W. Henderson, Superintendent, Water Commissioners, Peterborough, Ontario.

No Tender necessarily accepted.

S. R. ARMSTRONG,
Secretary, Water Commissioners,
Peterborough, Ontario, Canada.

6th May, 1909.
20

City of Moose Jaw

Saskatchewan

Tenders will be received by the City of Moose Jaw addressed to the undersigned, on MONDAY, MAY 31ST, at 8 o'clock p. m for the

SINKING OF A TEST WELL

for Gas, Oil, or Water the Contractor to undertake to complete the well before being entitled to any portion of his contract and to provide a schedule showing the allowance he will make on his full contract price if the City call him to stop work at less than the depth agreed upon ; the Contractor to provide everything necessary except the well casing now in possession of the City, which he shall take over and allow for at a price to be named in his tender. Tenders are to be accompanied by a deposit of 5 per cent. on the contract price, said deposit to be returned to the Contractor as soon as the plant has been put in operation on the ground.

Alternative tenders are required for a well 2500 feet and 3000 feet respectively, the lowest or any tender not necessarily accepted.

JOHN D. SIMPSON,
City Clerk.

Moose Jaw, April 27th, 1909.
20

For Sale

123 Sewer Braces, also one 6" Centrigugal Pump
Box 741, CONTRACT RECORD, Toronto.
21

Tenders

Tenders addressed to the undersigned, at Ottawa, and marked on the envelope, "Tender for Illuminating Oil" will be received up to noon the

TWENTY-SECOND DAY OF MAY, 1909

for the supplying and delivering of 170,000 gallons, more or less, of lighthouse illuminating oil, made according to specification, for the season of 1909.

Specifications and form of tender can be procured from the Collectors of Customs at Toronto, Petrolea, Sarnia, from Agents of the Department at Montreal, Quebec, St. John, and Halifax, and from the Department here.

Each tender must be accompanied by a deposit cheque equal to five % of the total amount of the tender.

The Department reserves the right to accept the whole or any port of a tender.

Papers inserting this advertisement without authority from the Department will not be paid for same.

G. J. DESBARATS,
Acting Deputy Minister of
Marine and Fisheries.

Depart. of Marine and Fisheries,
Ottawa, Canada, 6th May, 1909.
20

Tenders for Bridge

Sealed Tenders, whole and separate, for substructures and superstructures for the several bridges proposed to be erected in the following places in the Province of Ontario endorsed, "Tenders for Bridges," addressed to the undersigned, will be received at this Department until noon on TUESDAY, JUNE 1ST, 1909:—

Wabigoon River, at Dryden—Steel superstructure on concrete abutments or **Reinforced Concrete Arch.**

Vermillion River, at Whitefish—Steel superstructure on concrete abutments.

Burnt River, Township of Snowdon—Steel superstructure on concrete abutments or **Reinforced Concrete Arch.**

Spanish River, Township of Nairn—Steel superstructure on concrete abutments.

Murdoch River and Courchace Bay, Township of Bigwood—Two timber bridges.

Rossport, District of Thunder Bay—Concrete culvert and earth filling.

Plans and specifications may be seen and forms of tender obtained at this Department, at the offices of Mr. A. L. Quartermain, Architect, Kenora ; Mr. A. L. Russell, Civil Engineer, Port Arthur, and Messrs. Demorest, Stull and Lowe, Civil Engineers, Sudbury.

An accepted bank cheque payable to the order of the Hon. J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender and the bona-fide signatures and addresses of two sureties, or the bond of a Guarantee Company, approved by this Department, must accompany each tender.

The Department will not be bound to accept the lowest or any tender.

By order,
H. F. McNAUGHTEN,
Secretary of Public Works.

Department of Public Works, Ontario,
Toronto, May 15th, 1909.

Newspapers publishing this advertisement without authority will not be paid for it.
21

Town of Gravenhurst, Ont.

Waterworks Tenders

Separate or Lump Tenders will be received by the undersigned until 7 p.m., MAY 28TH, for the following:

1225 ft., 10 inch Pipe
3600 ft. 6 inch Pipe
20 Hydrants
2 Turbine Pumps and Motors
3200 ft. 8 inch Pipe
200 ft. 12 inch Intake Pipe
Valves for fire purposes

Specifications and all other information will be furnished on application to the Town Clerk.

W. H. CROSS, Town Clerk,
Gravenhurst, Ont.
20

Town of Pembroke, Ont.

Tenders for

Electric Motor and Pump

Tenders will be received up to and including, TUESDAY, JUNE 1ST, by James P. Sarsfield, Chairman of the Water Works Committee, Pembroke, for one Turbine Pump direct connected to a two-speed wire wound Motor mounted on one base. Pump to be capable of delivering twelve hundred, (1200) imperial gallons per minute against 210 feet and 320 feet respectively. The suction lift at extreme low water will be 25 feet to centre of shaft. The guaranteed efficiencies of pump and motor at half, three-quarter, and full load on each speed to be submitted with tenders.

Pump to be erected on foundations provided by the town, and one spare impeller is to be supplied by the contractor, as is all necessary check valves, foot valves and ordinary valves.

Further particulars will be supplied by B. G. Michel, C.E., Town Engineer, Pembroke.

The lowest or any tender not necessarily accepted.

J. P. SARSFIELD,
Chairman, Water Works Com.
Pembroke, Ont.

Pembroke, Ont.,
May 14th, 1909. 21

Positions Wanted or Vacant

BRICKMAKERS WANTED—One good shifter; two good setters-off; at once. Apply Box 759, CONTRACT RECORD, Toronto. 20

BRICK SETTER AND WHEELERS WANTED; we make 40 thousand brick a day; rack a pallett yard; will let setting and wheeling by contract or day work. Box 760, CONTRACT RECORD, Toronto. 20

WANTED—First year School of Science man, honors taken in last examinations, would like to hear of any vacant position whatever, construction or survey work preferred. Has also had experience as railroad clerk and timekeeper. Box 751, CONTRACT RECORD, Toronto. 20

WANTED—FOREMAN FOR BRICK WORKS in the West, capable of handling men, machinery and up and down draught kilns; one with knowledge of hollow brick preferred. None but first-class man and hustler need apply, Box 762, CONTRACT RECORD, Toronto. 20

TINSMITH WANTED—None but A1 mechanic need apply; one capable of doing all kinds of general tinsmithing, shop work and jobbing; estimating and taking charge of shop; state experience and salary expected; references. Box 761, CONTRACT RECORD, Toronto. 20

Miscellaneous

FOR SALE—ONE "SHELDON" ¾ HOUSED, 110" STEEL PLATE, PULLEY FAN, Up discharge with one 4,000 ft. heater. Price on application. Apply Box 758, CONTRACT RECORD, Toronto 20

FOR SALE—ONE 20x46 WHEELOCK ENGINE, non condensing, speed 70, left hand, runs under, fly wheel 16'x32", weight 25000 lbs. Reason for selling, larger engine same type installed. Price on application. Apply Box 757, CONTRACT RECORD, Toronto. 20

Tenders Wanted

Tenders for all or any of the several branches of work and material required in the erection and completion of a factory building to be erected at Paris, Ontario, for the Sanderson Harold Co., will be received up till noon, WEDNESDAY, JUNE 2ND, 1909. Plans and specifications may be seen at the office of the Architects. All tenders shall be sealed, marked "Tenders", and addressed to Messrs. Taylor & Taylor, Architects, Hope Chambers, Brantford, Ontario. The lowest or any tender not necessarily accepted. 20

Town of
North Toronto

Tenders are invited for the erection of a Concrete Bridge and Retaining Walls in Davisville Avenue, North Toronto, for the Mayor and Town Council of North Toronto.

Plans and specifications can be seen and full particulars obtained of the undersigned. A set of plans and specifications will also be deposited at the Town Clerk's Office, Eglinton, North Toronto.

Tenders endorsed "Davisville Avenue Bridge" and enclosing a marked cheque equal in value to 5% of the amount of tender and payable to the Town Treasurer, North Toronto. Such cheque will be returned unless the tenderer fails upon request to enter into a contract at the rate stated in the tender.

Tenders are to be delivered or sent by mail to W. J. Douglas, Esq., Town Clerk, Town Hall, (Eglinton Post Office), North Toronto, on or before 7.30 p.m. FRIDAY THE 28TH DAY OF MAY, 1909.

N.B.—The Town Council do not bind themselves to accept the lowest or any tender.

WALTER S. BROOKE,
Assoc. M. Inst. C.E.
Engineer.

Equity Chambers,
24 Adelaide St. E.,
Toronto.

19th May, 1909. 20

Miscellaneous

(Continued from page 21)

raising of $26,400 for macadamizing streets in the business district; $14,000 for extension of waterworks system; $10,000 towards equipment for the electric plant; $9,600 to provide for sewer extensions; $13,000 for grading streets and building sidewalks.

Sudbury, Ont.

Tenders for grading several sections of the Sudbury & Sault Ste. Marie trunk waggon road will be received until May 27th by J. O. Reaume, Minister of Public Works, Toronto.

Toronto, Ont.

The Works Committee have decided to ask the Board of Control to provide $5,000 for roadways in Deer Park and other outlying districts recently annexed to the city. The city engineer stated that it would require this amount to put the roads in a state of temporary repair. In regard to purchase of sand from contractors at western channel for filling in Ashbridge's Bay, it was decided that no action should be taken until the committee had obtained plan for improvement of Ashbridge's district, which has been prepared by Mr. J. G. Sing, resident government engineer, and approved by City Engineer Rust.

Victoria, B.C.

The fire wardens are asking for a quantity of new apparatus, including 500 feet of hose; two Seagrave combination chemical and hose wagons, to cost $5,600; one hose wagon, to cost $700; one city service truck, $1.700; four Gamewell fire alarm boxes, $380; hose ropes, flexible nozzles, salvage covers, etc., $620.

Woodstock, Ont.

Tenders addressed to F. G. Jackson, Clerk, East Oxford, will be received until May 29th for trenching, laying and covering of 9,222 feet of tile drain, according to plans and specifications prepared by F. J. Ure; also for furnishing the following tile: 1,500 feet 14 inch, 1,100 feet 12 inch, 2,650 feet 10 inch, 2,305 feet 8 inch, 700 feet 7 inch and 960 feet 6 inch.

AWARDED.

Prince Albert, Sask.

Tenders for relaying the pipe line to Goschen were received as follows: McVean & Craig, $3,237; Welsh & Campbell, $4,900; George Pickering, $4,348; Boulton & Company, $4,000; George J. Fanell, 60 cents a foot. McVean & Craig's tender was accepted.

New Companies

Plumbing & Engineering Supply Company, Limited, Fort William, Ont., incorporated, capital $200,000. Incorporators, A. Cameron, D. McCallum and D. Anderson, all of Fort Wililam, Ont., and others.

National Equipment Company, Limited, Toronto, Ont., incorporated, capital $40,000. Incorporators, M. J. Quinn, R. J. Cluff, T. Southworth, Robt. Paterson and T. A. Rowan, all of Toronto.

Orr Plating and Manufacturing Company, Limited, Toronto, Ont., incorporated, capital $40,000. Incorporators, T. C. Orr, W. H. Cresswell, P. J. Cooper, S. E. Bosworth, and others, of Toronto.

Chapman & Walker, Limited, Toronto, Ont., incorporated to manufacture electrical and other machinery, etc., capital $50,000. Incorporators, J. S. Lovell, W. Bain, R. Gowans, Henry Chambers and R. M. Coates, all of Toronto.

Tilbury Telephone Company, Limited, Tilbury, Ont., incorporated, capital, $40,000. Incorporators, W. C. Crawford, J. S. Richardson, H. J. Benglet, all of Tillbury, Ont., and others.

Railway Materials Company, Limited, Toronto, Ont., incorporated, capital $20,000. Incorporators, B. Osler, A. G. Ross, W. B. Smith, W. S. Edwards and G. C. Lovey, all of Toronto.

Business Notes

Holmes & Monks, builders, Montreal, Que., have registered.

McArdle & Fitzsimmons, plumbers, Hamilton, Ont., have dissolved partnership.

The capital stock of the Big River Lumber Company, Limited, has been increased from $250,000 to $1,000,000.

The MacGregor Grain Growers' Elevator Company, Limited, MacGregor, Man., has obtained articles of incorporation.

The corporate name of the Canadian Mineral Rubber & Paving Company, Limited, has been changed to the Canadian Mineral Rubber Company.

The Canadian White Company, Limited, will henceforth be known as the Superior Construction Company, Limited, letters patent having been issued in this connection.

The Howe Sound & Northern Construction Company, Limited, builders and contractors, etc., have been incorporated under the laws of the Province of British Columbia with a capital of $10,000.

The Municipal Construction Company, Limited, has been incorporated under the laws of the province of British Columbia to manufacture piping and appliances for the supply of water to municipalities and companies. Capital $25,000.

Personal Mention

Mr. F. Rockhill has been appointed bridges and building master of the southern division of the G.T.R.

Mr. Wm. M. Treadgold has been appointed city engineer of Brampton, Ont.

Mr. E. E. Colley, formerly of the C.P.R. engineering staff, has been appointed city engineer of Nelson, B.C.

Muralt & Company, New York, have opened a branch office in the Temple Building, Toronto, Ont., in charge of Mr. J. Engh.

Professor Herdt, of McGill University, Montreal, has been retained by the city of Winnipeg to report upon the electrolysis problem.

Mr. Sifroy Leger has been appointed contracting agent of the Canadian Northern-Quebec and Quebec and Lake St. John Railways in Montreal.

Mr. J. W. Dawsey, superintendent of the northern division of the Canadian Northern Railway, with headquarters at Dauphin, Man., has resigned.

Watson, Jack & Company, Montreal, have removed from the Bell Telephone Building in that city to Room 709, Power Building, 83 Craig street west.

Mr. W. S. Skinner has been appointed by the city of Moose Jaw, Sask., consulting engineer in connection with the installation of the light and power system.

Mr. L. M. Jones has resigned his position as assistant city engineer of Port Arthur to join the staff of Messrs. Smith, Kerry & Chace, consulting engineers, Toronto.

Mr. Philip J. Turner, F.R.I.B.A., architect, Mont-
ing. He has also dissolved his partnership with Mr.
real, has moved his office to 121 Board of Trade Build-
James E. Adamson.

Mr. W. Percy Over, of Winnipeg, who has been associated with Messrs. Darling & Pearson for upwards of 20 years, has gone into business on his own account, with offices in the Canada Life Building, Winnipeg.

Mr. A. F. Macallum, the new city engineer of Hamilton, Ont., has taken up his duties. Prior to doing so, he undertook a little tour round Europe with a view, probably, of getting special inspirations for the progressive people of the Ambitious City.

Mr. L. L. Pullen, Calgary, Alta., has been spending a few weeks in Toronto, having some tests of his silica fire brick and paving brick made at the works of the Berg Brick Machinery Company. Mr. Pullen is about to erect a modern brick plant in Calgary.

Mr. Willis Chipman, consulting engineer, 103 Bay street, Toronto, who for the past six years has conducted several branch offices throughout the western provinces, has opened an additional office at Canada Life Building, Winnipeg.

Dr. J. A. Waddell, C.E., of Kansas City, who is now engaged in building a bridge, 3,290 feet long, at Vancouver, B.C., is a Canadian and hails from Cobourg, Ont. He is a son of the late Sheriff Waddell. Mr. Robert Waddell, C.E., is a brother, and Mr. Hugh Waddell, of Peterborough, Ont., a cousin.

Mr. John Least, a Hamilton sewer contractor, recently had a narrow escape from death. He was working in a sewer on Sophia street, when it caved in, burying him beneath several feet of earth. Fortunately assistance was soon at hand. Mr. Least was almost dead when taken from the excavation, but was happily revived and taken to his home.

Dr. Rudolph Hering, of New York City, who was recently consulted by the city of Toronto in connection with the sewage disposal system, has been appointed consulting engineer for the bond issue sewers and a garbage disposal plant in San Francisco. Dr. Hering has also been retained to draw up preliminary plans for the improvement of the sewerage system of Atlanta, Ga.

Obituary

Mr. J. B. Laflamme, who was widely known throughout Canada as a superintendent of railway construction, died recently at Montreal. The late Mr. Laflamme first distinguished himself in his line of work in Texas and Mexico in the '80's, when he had charge of the construction of a railway for the late Sir R. G. Reid. This work was successfully carried out under most adverse conditions, among which were the treachery of rivers to be bridged, which became very much swollen and rapid at times without warning, and the hostility of the Indians. The work had to be carried out under military guard to keep the builders from being massacred.

Mr. Laflamme had charge of the construction of the section of the C.P.R. along the north shore of Lake Superior, and afterwards associated himself with Mr. W. J. Poupore, contractor, of Montreal.

The death occurred recently of Mr. John Williams, City Bridge Engineer for Toronto. The deceased gentleman was held in high esteem by all with whom he came into contact. The late Mr. Williams was born at Manchester, Eng., in 1842 and had been in the city's service for 22 years. He came to Canada in 1870, when he entered the service of the old Great Western Railway at Hamilton. He remained there four years, and returned to England. Mr. Williams came to Canada again in 1887, and became mechanical draughtsman in the City Engineer's department, Toronto. In a short time he was promoted to the position of bridge engineer, and he supervised the construction of the Queen street subway, and the following bridges: Sherbourne strret, Huntley street, Queen street east, Don, Dundas street, Wallace avenue and Lansdowne avenue. Mr. Williams was a member of the Canadian Society of Engineers and the Engineers' Club, Toronto. Mr. Fred Williams, C.E., of Cleveland, Ohio, is a son.

Messrs. Crossley Bros., the well known gas engine builders of Manchester, England, announce that in addition to supplying producer gas plants for utilizing bituminous coal, lignites, coke, sawdust, shavings, charcoal, etc., they have now designed a gas plant for utilizing the smoke box char which is usually taken from the smoke box of locomotives, similar material being also taken from the residue from blacksmith's hearths, and the like. This plant has not been designed simply to support a theory, but has been put to practical use, and the plant s now offered as a commercial proposition in a number of standard sizes. Messrs. Crossley's Canadian agency is conducted by Messrs. Laurie & Lamb, engineers, 212 Board of Trade Building, Montreal.

Concentrate your special forces and aptitudes. Remember there are men for every business. The difference in men and their success may be largely attributed to concentration and force, as well as to their habits of business.

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J. V. McNAULTY, Representative.

SUBSCRIPTION RATES.

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Retrospective and Prospective

Experience has taught us that when our cousins across the border sit up and take notice of anything that is happening outside their own domains, there is in all probability "something doing.'

Apropos of the busy times in the Canadian building industry during the first three months of the current year, the "Improvement Bulletin," of Minneapolis, Minn., has this to say: "Phenomenal increases over a year ago in building permit totals are not confined to the United States. The March reports from Canadian cities furnish similar striking evidence of the wonderful change that twelve months has wrought. Our next-door neighbor, Winnipeg, heads the list with a jump of 646 per cent., from $114,100 to $851,700. For the first three months of the year Winnipeg has rolled up a total of $1,059,000, against $141,000 for the same months of 1908. For the 15 cities reporting, the grand total for March is $4,510,955, against $1,986,108, an increase of 127 per cent."

The people of the United States are beginning to realize what some of our own people do not properly appreciate, viz., that with careful business methods, confidence and enterprise, Canada, in this generation, will come into her own. Such a reflection should spur us to greater effort. Much has been achieved in the past, but far more remains to be done. There is need for keener acumen, greater confidence and more of that spirit of progressiveness which has placed the United States on the high pinnacle she now occupies.

The achievements of the United States were begun and continued under somewhat less favorable conditions than ours. Almst from the outset we have had much to favor phenomenal development, and to encourage us to the greatest enthusiasm. We have had much reason to be thankful for the privilege of contributing to the working out of the country's important destiny.

This may sound ultra patriotic, but, after all, patriotic motives are the best foundation for individual effort. It may be said that there is another more general aspect than that of patriotism, but this is the truest, and the one which, sooner or later, "leads on to fortune." The man whose spirit is buoyed up with patriotism is nerved to persistent endeavor. He has an ideal, and the confidence and tenacity to work for its fulfilment. Aside from this, however, and from a selfish standpoint, it behooves us to put into our work all the application and zeal we possess.

There never was a time when there was greater reason for confidence than the present. As the season advances, the building outlook continues to improve. The spring has come and nearly gone with practically no suggestions of the labor troubles which marked previous years, and no immediate boost in the price of materials is anticipated. A fine example has been given by Winnipeg and other Canadian cities during the first quarter of 1909. Our American cousins are welcome to take notes of our progress, but the lesson should first be appreciated by those for whom it was directly prepared.

When Dreams Come True

Have you dreamed of a home of your own, where the longings of a renter's lifetime should come true? A little house, but fit—with a screened porch, a vestibule, a recess for the refrigerator, electric lights, hardwood floors, windows in the closets and everywhere else, a man-sized bath-tub, a furnace that heats and a sure enough coal burning fireplace instead of that gas burning bluff?

Now is the time to make your dream come true. Lumber is plentiful and comparatively cheap. Steel products are reduced in price. Cement, lime, brick and building materials of all sorts are on hand in good stocks and may be had at reasonable figures. Your savings will go farther toward that home of your own now than at any time for years past.

Some sweet day we'll all wake up to find that somebody left the suppression door open and confidence got loose in the night. Then business and employment and prices will boom together. The new crops will begin to move. Freight rates will pop and there'll be no more bargains in lath and plaster.

Don't be caught asleep. Take the tide at its flood. Bear a hand to help things along. Buy a lot. See an architect. Talk with a building contractor. Spend some money. You'll get a litle home with the hardwood finish, and you never can tell how much money you've saved and how much good you've done.—Exchange.

The Future of the Clay Industries in Ontario

Changes in Present Methods Needed — Interesting Consideration of Subject By A. V. Bleininger, Ceramic Chemist, U. S. Geological Survey

Unlike the unglaciated parts of the North American continent, the southern part of the Province of Ontario does not command the use of large deposits of shales and fire clays. Its principal clay deposits consist of glacial or secondary glacial clays which belong to the class of impure clays both chemically and physically. We are dealing hence with the question of making the most of these materials to satisfy the demands of a rapidly growing building industry and a more and more exacting civilization. The problem must be met by the adoption of processes which enable the manufacturer to produce better and a larger variety of higher grade structural materials with these various clays, ranging from the fine-grained, excessively plastic secondary glacial clays, to the sandy clays, full of rock debris consisting of granite, limestone, sandstone and other rocks.

This evidently means that while some of these deposits still permit of the use of simple machinery and kilns, a great number of clays cannot be worked successfully without the use of better plants. It is impossible to consider the extension of the brick industry into such fields as the manufacture of face bricks, terra cotta, hollow building bricks and blocks, radial and other hollow shaped bricks for various purposes, fireproofing, roofing tiles, quarries, sidewalk tiles, paving bricks, drain tiles, etc., without the realization that a change in the present modes of preparation and burning must take place. The question then arises quite naturally as to whether this whole proposition is really worth while, whether it is really possible to produce wares such as are indicated above from the clays available in Ontario. To answer this question we must look to Europe for information, to England, Holland and northern Germany. In all of the three countries mentioned glacial clays are being worked into higher grade building products, especially in the last two, where no other raw materials are available. There thorough preparation has enabled the manufacturer to produce tiles of all shapes, including roofing tiles, hollow ware and even paving brick. There is no reason why, with modern machinery, we cannot accomplish the same or superior results. This is more than confirmed by a number of Canadian clay plants which manufacture from glacial clays products of excellent quality.

Diversity of Ontario Clays.

Owing to the great diversity in the character of glacial clays and their impurities, each deposit presents practically a problem of its own, but still some general propositions might be kept in mind. Thus, fine grained clays which prove to be too plastic to be worked economically, resulting in too great a loss on drying and burning, could by made workable, either by means of a preliminary drying treatment in a rotary dryer at a somewhat elevated temperature, say 400 degrees Fahr., or by the addition of sand, which should not be too fine or too coarse, but should consist of a mixture of various sizes. Very frequently where the nature of the clay is inherently of the so-called joint structure or excessively colloidal, drying, as suggested, before attempting to work it, offers the only radical remedy and at the same time causes the clay to be disintegrated and worked more easily, resulting in larger machine capacities.

Fine grained clays deficient in plasticity yield to no commercial treatment, and the only way of making them into brick products is by the slop mould or the dry press process.

For clays containing both large and small rock debris the rule should be to eliminate all rock fragments possible, by means of stone separators or preliminary screening. Here again clay drying would become a valuable feature, enabling the operator to use combination rotary screens and disintegrators, which would break up the dry clay lumps, screen off the clay and sand, and remove the rocks and pebbles. By means of such a machine, followed by a finer piano-wire or other screen, it would be possible to eliminate all limestone pebbles and to reduce the limestone particles passing the screens to the size in which they would not do any harm. For many clays the combination of dryer, dry-pan and screens would be very satisfactory and would give most excellent preparation.

The main consideration in the question of preparation should be to destroy the natural structure of the clay as thoroughly as possible, thus creating a homogeneous body the properties of which are uniform in all directions. As soon as we do this we shall obtain after burning a material which is superior to natural stone and any other artificial product as regards durability.

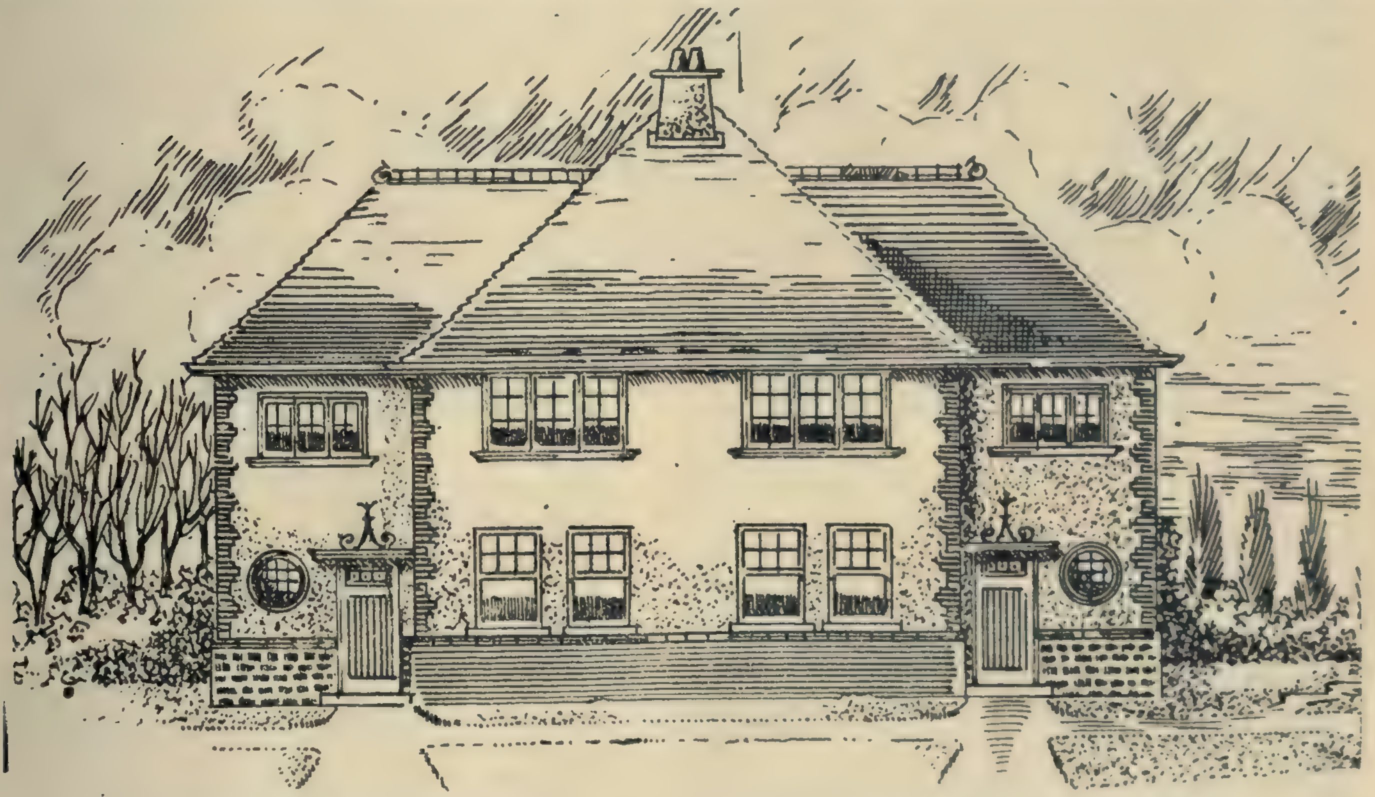
There is no reason why a red burning glacial clay thus prepared, if at all of suitable chemical composition, should not be used for many purposes for which it is now considered unfit. In this way the money expended in the higher cost of preparation would be amply repaid and wider markets opened for the manufacturer. The writer has seen streets paved with bricks made from glacial clays which had been down for more than ten years, subjected to considerable traffic and which still were in excellent condition. He also has tested such clays which showed a behavior in burning equal to that of the best shales.

Geological Generalizations Impossible.

In all of this work it must be distinctly kept in mind that geological generalizations as to the quality of surface clays in a certain district cannot be made. Each deposit should be tested thoroughly for itself, for it is the result of strictly local conditions. It is quite evident, hence, that this matter of exploration of clay beds by prospective manufacturers is of extreme importance. It also is a fact that many glacial clay deposits represent such a hopeless jumble of materials that it would be utterly futile to attempt their use. This point must be settled by each man for himself.

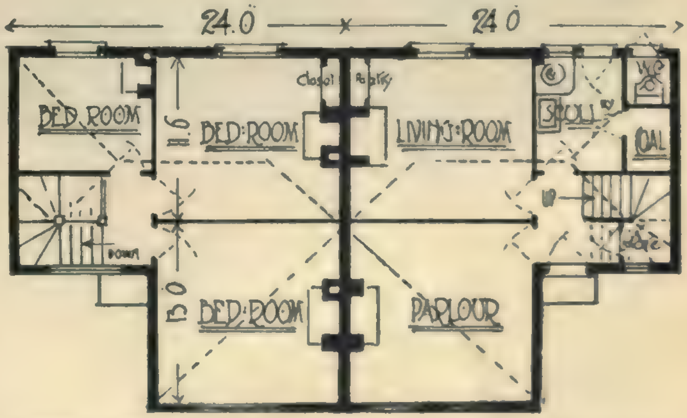
Again, the question of kilns is an exceedingly important one for the future of the industry. It is impossible to manufacture the higher grade of clay products in the present scove kilns on an economical basis, and we might as well realize the fact that we must in the future look to the down draft kiln, with its waste heat system, for drying, or to the continuous kiln. As a matter of fuel economy and with the favorable results which have been obtained recently in the burning of paving bricks in some American plants with the use of the continuous kiln, it seems quite evident that the solution of the burning problem rests with this type of kiln. Undoubtedly, there is room for improvement upon the European continuous kiln, to adapt it to American conditions, but these are now being made rapidly. At the same time we must learn to use cheaper grades of fuel than are now employed for burning clay products, which may, in certain cases, lead us to the gas-fired continuous kiln.

As regards these speculations, involving decided changes in the methods of manufacturing brick products, some might naturally ask what will become of the man of small means now engaged in brick making, in the face of such costly changes? To this question we must reply that undoubtedly in many instances the small temporary brickyard will be replaced by a permanent plant, well equipped with modern machinery and kilns. But, after all, this is a question of the market conditions and the available clay deposits. Many places offer no market for products such as have been indicated before, and again, many clay deposits would not justify the investment required by works of this character. But, nevertheless, it is the inevitable result that in the larger markets, the numerous small yards will be replaced by larger and better equipped concerns. In this way the technical standards of the business are raised constantly to meet the demands of the future, so that finally the place of the old fashioned itinerant brick maker is taken by the modern brick factory. Thus brick making is raised to the dignity of a well established, fixed industry which requires as much intelligence and training as any other branch of technology. The modern brick works offer to the architect and builder a variety of products which are necessary for the artistic and sanitary development of our cities, and, in fact, indispensible to civilization.



Attractive Dwellings for Artisans

The designs published herewith are a suggestion by a London architect in "The Timber News" for a pair of workingmen's cottages. The dwellings have found considerable favor in the old country, where they have been erected at a cost of about $875. The designs call for rather an extended frontage and consequently it would not be advisable to adopt them in a locality where land is expensive. Where land is cheap, however, these dwellings are particularly suitable, and should make a good return for money invested in their erection. The floor plans explain themselves.



The attention of Architectural Students is directed to the Competition inaugurated by the "Contract Record" for designs for a $2,500 suburban town, or small city house. Full particulars were published in the issue of May 12.

Building permits issued at Regina during April this year totalled $71,875, against $31,098 for April, 1908.

Isolated instances prove possibilities, and nothing more.

Municipal Engineering and Construction

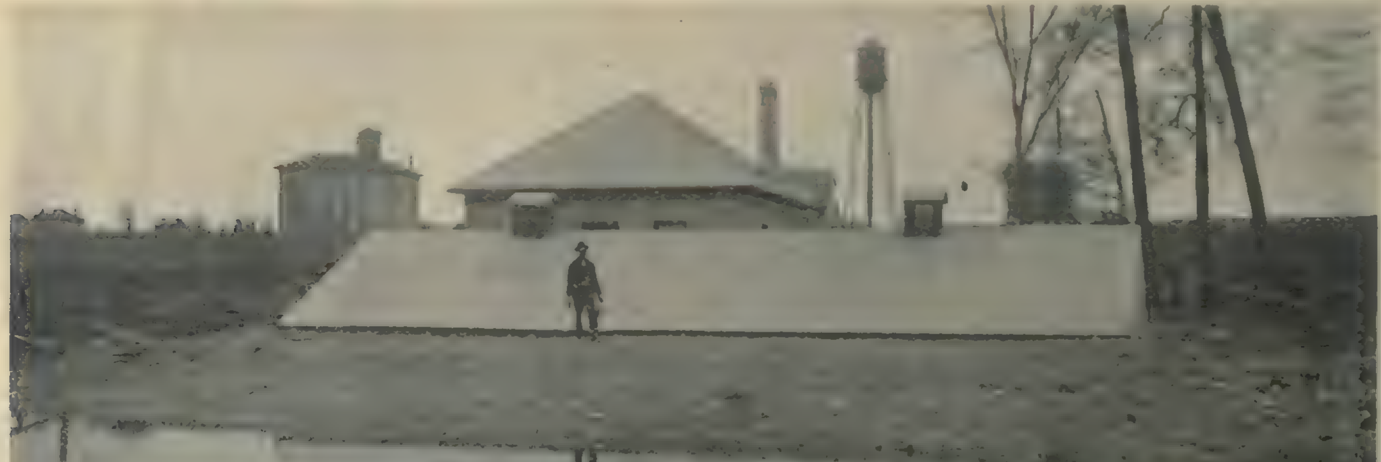
Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

The Elmira, Ont., Waterworks System

Herbert J. Bowman, Engineer

Elmira is situated in the northern part of the busy county of Waterloo, and has the advantage of excellent shipping facilities, but two years ago it was seen that to attract new industries a system of waterworks would have to be built. The situation being explained to the ratepayers, it was decided to raise $25,000 for this purpose. This might be thought a large undertaking for a village of 1,500 inhabitants, but it has placed Elmira on an even footing with her larger rivals in the race for new factories, besides affording fire protection and the best of water for domestic purposes, without adding unduly to the tax rate.

There was no chance for a gravity supply of water at Elmira on account of the comparatively flat nature of the surrounding country, so a pumping system was required, and in the absence of water power it was at first contemplated to use steam. However, it was found that in the United States many small towns were pumping water to a standpipe or water tower by means of some form of internal combustion engine, and at much less expense for fuel and attendance than the old steam plants. So it was decided to call for tenders for gasoline and oil engines and a power pump. Eventually a 35 h.p. Blackstone oil engine was purchased and a direct acting duplex pump of a capacity of 500 gallons per minute. This comprises the whole of the machinery in the pumping station and is shown by the accompanying cut. The water consumption as yet is small and with proper management should not exceed 50,000 gallons per day, the fuel consumer being about three gallons of ordinary illuminating oil. This "kerosene" oil is not dangerous like gasoline, and furnishes th esame power, gallon for gallon, at considerably less cost. In England, the oil engine is largely used, and also to some extent in the United States. The Elmira engine is the first one to be used for waterworks purposes in Canada, and it is a distinct success. In ten minutes' time after entering the pumping station, the engineer has the machinery in operation, and on the completion of the day's pumping the oil is shut off, and in a few minutes' time the engine is rubbed down and needs no further attention until the next day.



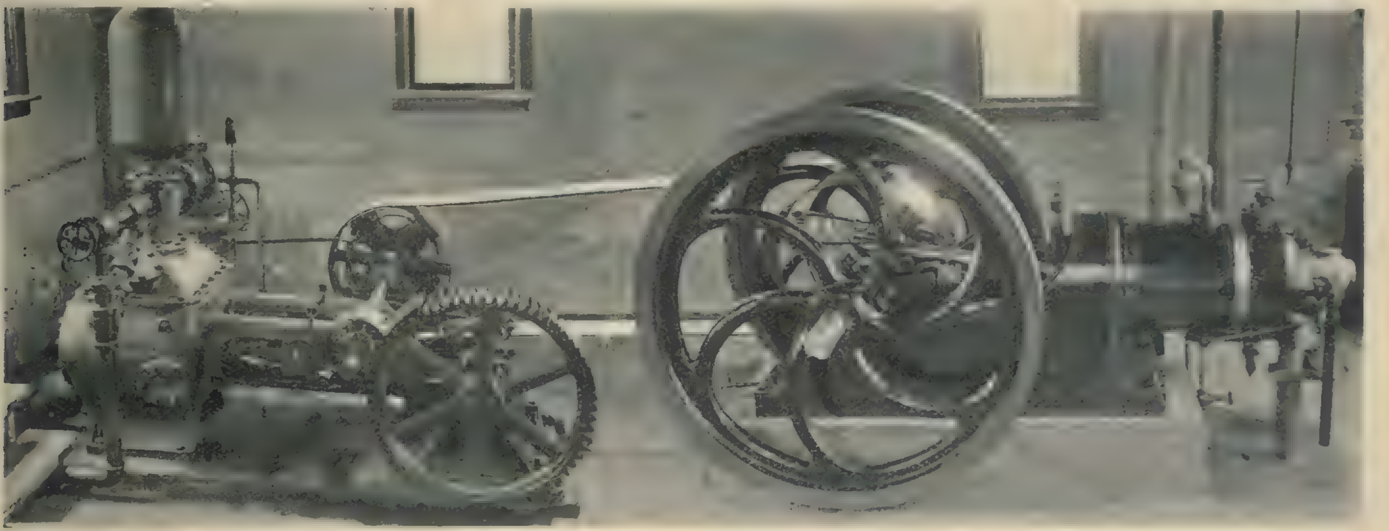
Elmira Waterworks—Pumping Station.

The pumping station was located above the town on a small spring creek which is damned up and can be used in case of a large fire. Water for domestic use is obtained from three artesian wells which flow into the large covered reservoir, shown in the cut of the pumping station. The small building, looking like an ordinary cottage, houses the pumping machinery, and on the hill beyond is seen the elevated tower. This is a steel structure 100 feet high and gives good fire pressure throughout the village. The mains consist of about 14,000 feet of 8-inch, 6-inch, and a little 4-inch cast iron pipe with 31 fire hydrants and necessary valves. The village council let contracts for the different parts of the work, and employed as engineer during construction, Mr. Herbert J. Bowman, of the firm of Bowman & Connor, civil engineers.

Any small town considering the building of a system of waterworks will do well by sending a delegation to Elmira, where the reeve and councillors will be pleased to show them over the plant.

In the first report on research work by Dr. Houston, director of water examinations to the London, Eng., Metropolitan Water Board, special reference is made to the general advantages resulting from the storage of water for comparatively brief periods. The beneficial effect of storing water even for a few days is said to be so great that river water should never be admitted to the filter beds in the raw state. Dr. Houston concludes from his investigation that storage for four weeks may be regarded as sufficient for the destruction of harmful properties originally possessed by the water. This opinion is one of much interest, for it directly suggests the practicability of superseding ordinary filter beds by mechanical filters capable of being installed at minimum cost and of treating large quantities of water with exceptional rapidity. The filter beds hitherto used in the

London waterworks system are costly structures occupying much valuable space and are not efficient if the daily rate of filtration exceeds about two million gallons an acre. On the other hand, mechanical filters are comparatively inexpensive, very compact, and quite efficient when the daily rate of filtration maintained is one hundred million gallons an acre. The Metropolitan Water Board, knowing perfectly well that enormous supplies of water could be obtained in the Thames and Lea valleys by additional storage facilities, are already arranging for the construction of reservoirs on a large scale. Therefore it is not improbable that before long the board may take into consideration the advisability of adopting mechanical filters for water that has been rendered innocuous by adequate storage. The economy claimed for the newer method of filtration is a specially important feature in view of the extensive programme formulated for the provision of increased water supplies in the metropolitan district.



Elmira Waterworks—Pumping Machinery.

Interesting to Municipal Engineers

In an interesting article, entitled "How to Construct and Preserve Macadam Roads and Prevent Dust," published in an attractively illustrated booklet, the Barrett Manufacturing Company, of New York, explain the uses of, and show the good results obtained from "Tarvia." Apropos of the widespread interest that is being taken in the subject of good roads, municipal engineers and officials will do well to obtain a copy of this booklet. Many prominent engineers and road experts have testified to the merits of "Tarvia" as a material for treating macadam roads. It is pointed out that materials manufactured from coal tar, as is "Tarvia," have stood the test of time, both in roofing and in foundation and tunnel waterproofing. "Tarvia" makes claims that should be investigated by every engineer. The Canadian agents for the Barrett Manufacturing Company are the Paterson Manufacturing Company, Limited, Toronto, Montreal, Winnipeg and Vancouver, and the Carritte-Paterson Manufacturing Company, Limited, St. John, N.B., and Halifax, N.S.

Messrs. Ouimet and LeSage, consulting engineers, of Montreal, against whom suit was taken for the sum of $5,000 for statements concerning the quality of supplies proffered them in connection with the Limoilou sewerage system, and which supplies were refused by them, have received judgment in their favor.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

435. Agents.—A London firm manufacturing varnishes, colors, enamels, paints, oils, etc., seek suitable agents for eastern Canada with the exception of Nova Scotia.

439. Edge tools.—A Manchester firm asks for catalogues and prices of edge tools from Canadian manufacturers.

448. Pine doors.—A Lancashire firm asks for description and prices of pine doors from Canadian manufacturers.

458. Agent.—A Midlands firm manufacturing small brass gas fittings, gas brackets and chandeliers, etc., also brass water fittings and electric light accessories, pendants, etc., are open to appoint a Canadian resident agent possessing the necessary connection among buyers.

503. Machinery.—A civil engineer at Sheffield with experience in electrolytic operations for metal recovery is prepared to investigate engineering projects, particularly metallurgical, or to purchase for, inspect, or test machinery or engineering supplies for Canadian firms.

504. Fire-clay goods.—A Cheshire firm manufacturing fire-clay goods of every description wishes to increase business connections in Canada.

506. Machinery.—A Scottish correspondent would like to get into communication with parties in Canada willing to form a company for the manufacture of certain classes of machinery (steam, electric, hydraulic, etc., hammers, haulage, transporting and hoisting gear, rock drills, air compressors, pumps, turbines, etc.). He would also be open to receive communications from owners of existing works.

508. Paints.—A London firm manufacturing oxide colors ask to be placed in touch with Canadian color importers and paint manufacturers.

509. Agent.—A West of England firm manufacturing high-speed enclosed self-lubricating steam engines and marine machinery, seek a suitable Canadian resident agent.

512. Agency abroad.—A firm in Glasgow, Scotland, wholesale dealers in engineering supplies and specialties, are anxious to get in touch with a Canadian manufacturer of electric drills, whom they could represent.

[**Note.**—Contributions suitable for publication in this Department are invited from subscribers and readers.

Suggestions for Ventilation

By H. M. Clark

Careful observation compels the statement that the warm air system of heating and ventilating is more healthful and therefore, in the final analysis, superior to any of the other methods at present practised. With steam or hot water heating there is a universal tendency on the part of occupants of rooms so provided, to neglect to avail themselves in cold weather of the facilities for changing the air of the rooms, if, indeed, any exist. Too frequently such rooms are merely provided with chimneys, which certainly extract a certain amount of the vitiated air but are without facilities for renewing the air supply, which finds its way in haphazard by cracks and crevices. The results of a few hours spent in such rooms, especially if there be more than three or four persons present, are not conducive to health. The superiority of a heating and ventilating system, which automatically supplies fresh air with any increase of temperature, is obvious. Furthermore, the system can be made to render good service in supplying cool air in summer. At the same time the application of the system must be practical and free from the defects so frequently associated with it. For example, in a residence under construction, it would not be difficult to provide two cold air ducts on opposite sides of the house, so placed as to ensure a good supply of sweet air free from dust, and controlled by a valve, so that either may be used according to the direction of the wind. The opening must be grated and lined with wire gauze and must, of course, be readily accessible. The air can be moistened in the heating chamber by means of an hygrometer and a pan of water communicating with a small cistern placed outside. In order that no basement air may be delivered in the upper rooms, it is most important that all points be air tight in the delivery ducts, of whatever material they are made. Earthenware drain pipes (where obtainable in sufficiently large dimensions) securely jointed to ground floors, have been used successfully, the ducts to the upper floors being brick built or of sheet metal.

Delivery of Fresh Air.

The method of delivery to the room is most important. The old hole-in-the-floor-dust-distributing register is, of course, intolerable, not only because a grating in the floor is necessarily a dust collector and unsanitary, but because the floor line is the correct position for the extract flue for vitiated air. The delivery aperture or register, then, should be placed in the wall above the breathing line, certainly not less than eight feet from the ground, the outlet register being placed in the same wall just sufficiently above the level of the floor to avoid the collection of dust or other obstruction.

Careful consideration is necessary in deciding the dimensions of delivery ducts and delivery registers. An English architect, Mr. G. A. T. Middleton, favors the following dimensions of warm air delivery ducts. They should be 50 square inches area per thousand cubic feet of ground floor space to be served; 40 square inches per thousand cubic feet for first floors, and 32 square inches per thousand cubic feet for second floors. Three feet per second is probably a satisfactory velocity in the ducts, provided the temperature of the inflowing air is not under 65 degrees Fahr., though rapidity of movement in the delivery ducts is, of course, immaterial, provided the delivery apertures or registers are sufficiently larger than the ducts to reduce the velocity and spread out the air as it enters the room. To ensure this, and bearing in mind that a good open grating has little more than two-thirds of its area clear space, the remainder being metal, the total area of the register should be double that of the warm air duct and trumpet-shaped, a duct of 50 square inches having, say, a 12 x 10-inch register.

In ordinary living rooms where the air does not require to be changed oftener than three times an hour, these dimensions have been regarded as sufficient to ensure ventilation without the creation of draughts. A revolutionary departure from conventional forms and dimensions of registers has recently been made by some English ventilating engineers, whose register for a living room is about 4 feet high by 1 foot 6 inches wide, panel shaped and inserted in the wall above the dado, after the manner of a panel. It is claimed that the large area of this register permits of equable ventilation with air at any temperature without a suspicion of a draught. A register of such dimensions becomes difficult to handle architecturally with regard to the appearance of the room, but with careful treatment the difficulty may be successfully overcome. The writer has seen a library in which the frame of the register harmonizes with the bookcase by which it is flanked, the result being very satisfactory. Indeed, with a due recognition of the importance of ventilation and the application of a little ingenuity, registers might cease to present the disfigur-

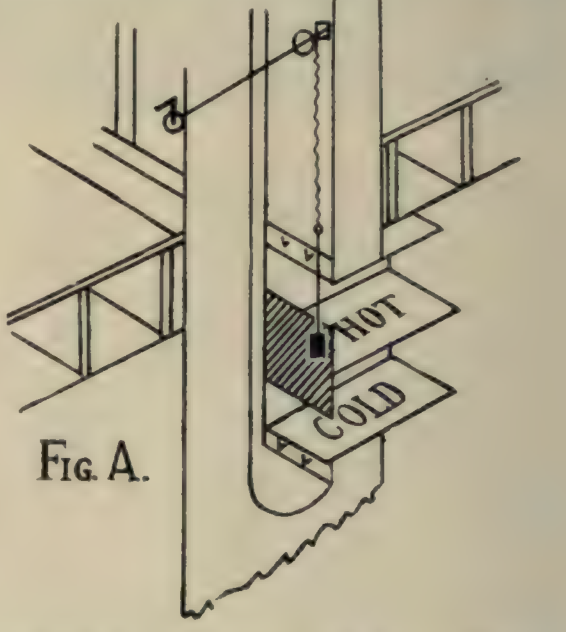


Fig. A.

ing appearance so often noticeable. A variation from the perpetual rectangular form might with advantage be made in favor of circular, oval or panel shapes conforming to the decorative scheme of the room.

Dimensions of Extract Flues.

For the dimensions of extract flues carrying warm vitiated air from rooms, the authority above quoted gives these figures: From ground floors, 32 square inches per 1,000 cubic feet of room space; first floor, 40 square inches; second floor, 50 square inches. Registers to these to be one-half larger, measuring over metal part of the grating. These extract ducts or flues should be carried well up and separately, not running into one large duct, a method which is favorable to what is known as back firing, and for the sake of appearance they may be hidden by false chimneys or turrets or some similar device.

In fully occupied places, such as hospitals, schools, factories and concert rooms, the question of appearance is subordinate to that of efficient ventilation. It must be admitted that this is not always obtained in spite of the facilities offered by mechanical ventilation with which such buildings are usually equipped. Calculations of the effect of ventilation may be interfered with by the space allowed each person in such buildings. The relation of floor area to space is occasionally overlooked. It is, of course, useless to calculate space as being higher than 12 feet. In such buildings the air system of heating and ventilating has advantages over other methods. Consider for example the excellent work of a combined fan and heater designed for use with the double dust system, supplying warm and cool air, which is becoming popular for hospitals, infants' schools and, indeed, private residences, where it is desired to maintain an equable temperature in any part of the building irrespective of the temperature out of doors. Especially is this system valuable in the summer, the provision of a cooling chamber through which the air passes permitting of a reduction of temperature often very necessary. This system, of course, necessitates the use of a mixing damper, placed out of sight, in connection with each register or series of registers. These mixing dampers frequently detract from the utility of the system through faulty design. The principal fault lies in the fact that the capacity of the damper, in practice, is usually considerably less than that of the combined ducts.

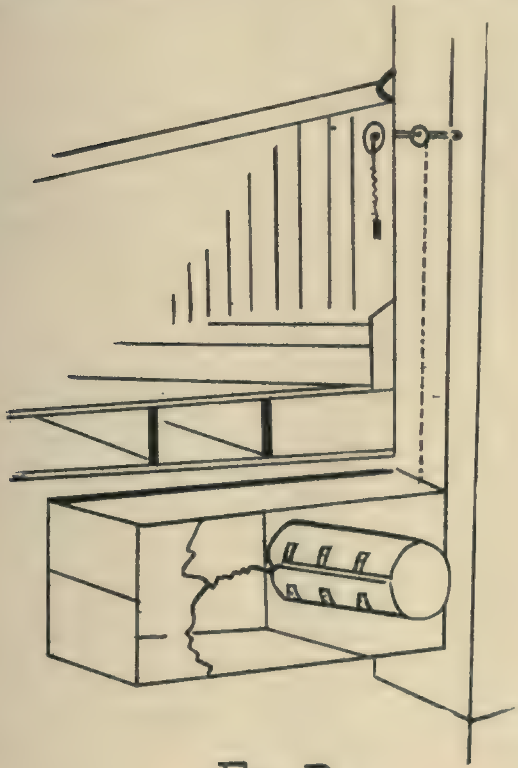


FIG. B

In the illustration, fig. A, which shows a typical mixing damper, the single plate working from the centre up or down only permits of the opening of all the cold air apertures or all the hot air aperture, or combined, an average of only 50 per cent. of each, any increase of one necessitating a decrease of the other and reducing by one-half the volume of air otherwise obtainable. The same criticism applies to the cylinder form of damper shown in fig. B. The correct form should permit of any increase of air flowing through one duct without a reduction of the volume flowing through the other, or of the full capacity of both ducts simultaneously, if desired. To secure this the mixing damper should contain two flat plates, one descending from above the ducts, the other ascending from below them, so adjusted that in their normal position the orifices of both ducts are completely open. They can be attached to each other and worked in a groove in the usual manner by a cord fixture in the room. The registers in the room could be fitted with the usual closing device, in case it should be desired to completely shut off ventilation from the room.

Copper for Steam Pipes

In a recent lecture before the Institute of Marine Engineers of London, Eng., J. T. Milton, chief engineer of Lloyd's Register, made an interesting declaration on the use of copper for steam pipes. Speaking on this point, he said:

"Copper is valuable for steam pipes chiefly on account of its ductility, its ability to withstand considerable repetitions of changes of form, and its non-liability to rust. Ordinary copper contains a proportion of impurities such as arsenic, bismuth, antimony, lead and other metals, but by electrical deposition it is possible to obtain pure copper. The latter is especially useful for electrical purposes by reason of its high conductivity. Impurities affect the conductivity to a great extent. The presence of bismuth in copper is exceedingly deleterious, one part in 1,000 rendering the copper useless for important works, as at high temperatures its strength is reduced, and the copper becomes very brittle.

"Impurities in copper, when in small quantities, on the whole have a good effect for most purposes, and the recent British Admiralty tests allowed 0.7 per cent. for these. In making sheet copper it is cast in slabs and first rolled when hot. Subsequent thicknesses are rolled cold, and the quality of the copper depends to a great extent on the amount of work put upon it in undergoing this process."

In the newer parts of Philadelphia, says an exchange, row after row of houses may be seen where the paint has completely peeled from the galvanized work. In Chicago the metal workers prevent this peeling by first dissolving in a glass jar or earthen vessel one ounce each of copper chloride, copper nitrate and salammoniac, in one gallon of soft water. When all the salts are dissolved they add one ounce of commercial hydrochloric acid. They apply this wash with a wide, flat brush. In a short time the metal turns black, afterwards drying a whitish-grey. Then they go over it with a dust brush to remove the surplus salt and paint as desired, with the consciousness that the paint will not peel if of good quality.

The Evolution of Structural Steel Work

In the last decade, many and great changes have taken place in the bridge and structural steel business. These changes are principally in designs of structures, in the improved facilities for the manufacture of steel and for its fabrication in the bridge shops, and, particularly, in the enormous increase in the demand for such material.

All large and many small manufacturing plants are now designed to use a maximum of steel and a minimum of timber or other building materials, and when combined with concrete for foundations, walls, etc., structures economical in cost are the result. A few years ago a steel roof or steel building was considered an expensive luxury and possibly a curiosity, now the reverse is the case. A few years ago the majority of highway bridges were built of wood, whereas, now, steel is almost exclusively used. Several years ago the majority of steel bridges had wood floors resting on timber joints A gradual improvement in construction took place and steel joists were introduced, and after that the concrete floors, so that now the almost universal practice is to use steel joists with concrete floors and to have all bridges designed for a reasonable concentrated load. This is the only proper method to pursue, for sooner or later it will doubtless be required that all bridges be covered with permanent floors of concrete or some other similar material. It is the opinion that all highway bridges built from now on should be designed for permanent floors and for concentrated loads of not less than ten tons on two axles. It is not necessary that the bridges be covered at the time of construction with permanent floors, as timber can be used in the meantime and the steel joists so arranged that the full life of the timber may be obtained and at some time in the future this floor be replaced by a permanent one.

General View of Works of the Hamilton Bridge Works Company, Limited, Hamilton, Ont.

Such changes as these, in conjunction with phenomenal railway and industrial development, have created a great demand for steel structures of every description. To meet this demand the Hamilton Bridge Works Company, one of the most progressive bridge-building concerns on the continent, have entirely rebuilt and remodelled their works, trebling their capacity of five years ago. The new works are located in the north-western portion of the city of Hamilton, on the site the old ones have occupied for nearly forty years. They cover about eight acres, with 2,770 feet street frontage. The main works are served by double track sidings into the shipping yards and the shops, and the stock yards are served by independent sidings. The company's unloading and shipping facilities are unsurpassed in Canada, being served by four large steel electric travelling cranes, located in the unloading, sorting and shipping yards. The works are operated by electricity, compressed air and natural gas throughout.

The company have successfully completed over 4,000 miscellaneous contracts in Canada. With characteristic enterprise they have just issued a unique and attractive catalogue, a copy of which should be in the hands of every municipal official, engineer, architect and contractor. Neither trouble nor expense have been spared in the preparation of this catalogue. The illustrations are excellent and the reading matter instructive. These illustrations include examples of the company's work in every province from the Atlantic to the Pacific and the accompanying notes describe the structures in detail and deal with any peculiarities which were encountered in their erection.

On one of the prefatory pages is provided a schedule of particulars which should be given in taking bridge tenders. When the frequent delays caused by some omission in this connection are taken into consideration, it would seem that this schedule alone should commend the catalogue to municipal engineers.

The company have an expert staff of engineers and estimators and are prepared to furnish information and preliminary sketches in regard to projected structures.

Cement Products Company's Annual Meeting

The annual meeting of the Cement Products Exhibition Company was held on May 11, at its offices, 115 Adams street, Chicago. Over three-fourths of the stockholders were represented at the meeting.

The report of the treasurer showed that the Cement Show of last February was a success financially as well as otherwise. After all expenses had been paid there was a surplus left, more than sufficient to cover the deficit incurred on account of the First Annual Cement Show, in December, 1907.

A resolution was introduced and unanimously adopted expressing the sentiment of the stockholders as opposed to the payment of any dividends and favoring the expenditure of all earnings arising from each show toward the promotion of succeeding exhibitions.

The following officers were elected for the ensuing year: Edward M. Hagar, president; Norman D. Fraser, vice-president; J. U. C. McDaniel, secretary-treasurer. Executive Committee: B. F. Affleck, chairman; J. U. C. McDaniel, Geo. S. Bartlett. Directors: Edward M. Hagar, president Universal Portland Cement Company; Norman D. Fraser, president Chicago Portland Cement Company; A. St. John Newberry, president Sandusky Portland Cement Company; D. McCool, president Newaygo Portland Cement Company; E. W. Shirk, president United States Cement Company; B. F. Affleck, general sales agent, Universal Portland Cement Company; J. U. C. McDaniel, sales manager Chicago Portland Cement Company; C. A. Whyland, president and general manager Elk Cement & Lime Company; Geo. S. Bartlett, vice-president Western Portland Cement Company.

LEGAL DEPARTMENT

Information for this Department is requested from Architects, Engineers, Contractors and Builders. Send in the particulars of recent cases in which you were interested, giving the main facts tersely.

Performance of Contract in "good and workmanlike manner."—In the case of Cole v. Smith, which recently came up in a Divisional Court of Ontario, appeal was taken by the defendants from the judgment of the local Master at St. Thomas finding the sum of $298.31 due to the plaintiff by the defendant W. B. Smith; and cross-appeal was taken by the plaintiff to increase the amount to $437.31, upon the ground that the defendants the Smiths, had accepted the work. The original action was brought under the Mechanics' and Wage-Earners' Lien Act to recover $430 claimed to be owing under a contract for the remodelling of a house, and also a sum for extras. By the contract the plaintiff agreed to perform the work in a "good and workmanlike manner and according to the best skill and art," and the defendant W. B. Smith agreed to pay therefor the sum of $250 "when the roof is on, and $430 when completed." The sum of $250 was paid, and the $430 sued for was the sum payable when the work should be completed. The Master found "that the plaintiff proceeded to do the work of remodelling, and finally turned it over to the defendants as completed; but, although the defendants were daily on the premises while the work was going on, that they did not accept the contract, and are entitled to a reduction in the balance claimed by the plaintiff by reason of faulty workmanship displayed in the work and inferior materials." The amount of such reduction he fixed at the sum of $142, which, being deducted from the stipulated sum of $430, and the sum of $10.31, allowed for extras, left $298.31, and for this amount and costs the Master gave judgment in favour of the plaintiff. The judgment of the Appeal Court was delivered by Mulock, C. J., as follows: For the defendants it was urged that the plaintiff had not completed his contract, and was, therefore, not entitled to recover the contract price, and could not recover upon a quantum valebat, because such was not the agreement between the parties. Here the plaintiff agreed to perform the work in a 'good and workmanlike manner," and the Master has found faulty workmanship. This finding has not been appealed from. The performance of the work in a "good and workmanlike manner" was a condition precedent to the plaintiff's right to recover the contract price. Not having performed the work in a manner entitling him to recover the contract price, the plaintiff is not entitled to payment thereof, nor can he recover on a quantum valebat, for there is no evidence of a contract to pay upon that basis. The plaintiff's counsel argued that the defendants had accepted the work, and that the inference should be drawn that he had waived the conditions of the contract and had agreed to pay the value of the work. Such waiver is a question of fact. Here the work was to be performed on a house situate on the defendants' land, and the plaintiff, having, as he alleged, completed the work, sued for the contract price. The contractor having thus withdrawn from the premises, the owner is left in exclusive possession. His retention of possession is not an act necessarily referable to the contract, and, therefore, does not warrant the inference that it was intended as a waiver of the terms of the contract, and as evidence of a new agreement to pay upon a quantum valebat. The cross-appeal fails, and the defendants' appeal is allowed to the extent of $288, being that portion of the contract price of $430 in question allowed by the Master. The plaintiff is entitled to payment of the $10.31 allowed for extras, and this amount should be credited on the costs payable to the defendants. Except as to this sum, the plaintiff's action should be dismissed with costs, including costs of this appeal.

Action for Recovery of Machinery Installed.—The Goldie & McCulloch Company recently brought action against the town of Uxbridge to recover possession of certain machinery and damages for detention of same. The machinery was installed in the premises of the Palmer Piano Company. This company got into difficulties and the town took possession of their premises and denied the right of the plaintiff to enter upon same and remove their machinery. The installation of the machinery was a matter of consideration. In order to install the same a cement bed had to be prepared to receive the boiler. It was further enclosed with brick and cement, so that to remove the same it would have been necessary to tear down a considerable part of the wall. This point was pressed by the defendants. Decision was given, however, mainly upon the fact that a sum of $2,644.94 was still due to the plaintiffs, and that consequently the town had exceeded its rights. The only course to prevent the removal of the machinery was to purchase the same by paying off the balance of the payment. The plaintiffs were authorized to remove their machinery and were awarded costs of the action.

Liability for Non-Repair of Street.—In the British Columbia court action was brought by one, Cooksley, against the city of New Westminster for damages for personal injuries, sustained owing to the bad conditions of the street. The feet of the plaintiff's horse went through the crust of the road into a culvert and in the subsequent melee the plaintiff was severely injured. The plaintiff's wife was also injured. The culvert had been constructed sixteen years previous to the accident. It was covered with cedar planking three inches in thickness placed about three or four inches below the surface of the street. In the course of the hearing Chief Justice Howay said that he was satisfied that the life of such a culvert was very uncertain—it might be anywhere between six years and twenty years. Since the construction of the culvert it had never been either repaired or inspected. The city escaped through a legal loophole, the province of British Columbia having no statutory liability for such non-repair. In the provinces of Ontario, Manitoba, Alberta and Saskatchewan there are provisions which make municipalities responsible for the repair of roads and streets and for damages sustained in default. The plaintiff's solicitor also endeavored to show that the rotten culvert was a public nuisance, but was technically unable to maintain his plea. The court held that it was regrettable that in this case where the plaintiff had suffered injury he was not entitled to succeed in a civil action. The remedy laid with the legislature. The action was accordingly dismissed, with a provisional award to the plaintiff of $505 if further judgment was required.

A Venetian red that looks bright when dry, but when mixed with oil shows up dull, may be set down as of bad quality. The only safe plan in buying all dry colors is to treat them in oil before deciding as to their quality.

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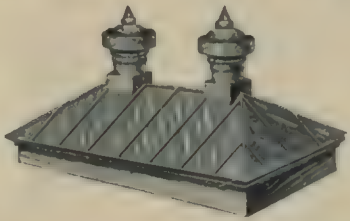
Craven, Dunnill & Co.
Limited
Jackfield, R.S.O., Shropshire

ENAMELS LUSTRES
WALLS

Metal Skylights



Our ACORN System of Skylight Construction gives the greatest strength and the maximum of lighting surface, at the same time. We can quote tempting prices on these Skylights, which have been used on some of the largest jobs in Canada.

Write us about our ACORN system, and we will send you literature telling all about our Skylights.

Metal Shingle & Siding Co.
Limited
Preston and Montreal

Vault Doors and Safes

J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO

Publications

"The Qualities of Tile," is the name of an artistic booklet published by the Trent Tile Company, of Trenton, N.J. In this booklet, the qualities, applications and advantages of various tile are discussed by Mr. C. F. Binns, director of the State School of Clay Working and Ceramics at Alfred University, N.Y. The reproduction in color of several good designs for a tiled mantel and for tiled walls for bathroom, cafe and hospital are a good illustration of what can be accomplished in this line.

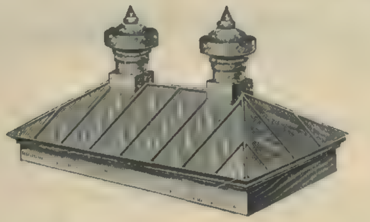
The Metallic Roofing Company of Canada, Limited, Toronto, Ont., have gotten out a carefully prepared, illustrated price list, which should be in the hands of every architect, builder and contractor. The excellence of the various lines manufactured by this company is widely known and the majority of our readers will need no introduction from the "Contract Record." The catalogue is printed in French and English. Copies may be obtained on application to the company.

The B. Greening Wire Company have just issued an unusually attractive catalogue, or rather a series of catalogues of their various products, comprising wire cloth, perforated metals, wire lathing, wire rope, wire chains, wire guards, counter railings, etc., the whole bound in one handsome volume for the use of their agents. Not the least interesting feature of the catalogue is the historical page. The name Greening appears to have been associated with wire for many centuries, the first needle factory in France having been started by a Greening, and later in England pins and needles were made by one of the same family. Benjamin Greening came to Canada in the fifties and became one of the pioneers of the wire industry. At his death he was succeeded by his son, S. O. Greening, who built the new works, and is president of the existing company. The works of the B. Greening Wire Company are up-to-date in every respect, and cover an immense area, giving employment to about 350 hands, the pay list running up to $3,000 weekly. The catalogue comprises a handsome volume of over 400 pages, with special illustrations of the works and of the different departments, as well as of all the various articles which the firm produces. The press work and typographical details are all that could be desired, the whole being bound in a dark green cloth, appropriately lettered in gold.

Messrs. Wettlaufer Bros., the well known manufacturers of cement mixers, have opened a warehouse in Toronto at 8 Alice street. This firm report that they have met with gratifying success in Toronto during the past year and a half. They state that since the spring of 1908 they have sold in the city 27 power mixers, besides a large number of brick machines, block machines and hand mixers. Among recently purchasers of power mixers they report the following: Lucas & Son, Queen City Concrete Paving Company, Thomas McMurray. All their new machines are equipped with automatic hoppers, as required by the Toronto city by-laws, and machines sold last year are now being mproved by the addition of this device.

Building is getting very active at Ottawa. The permits for the month of April totalled $359,600, as compared with $265,658 for the corresponding period of last year.

Metal Skylights



Our ACORN System of Skylight Construction gives the greatest strength and the maximum of lighting surface, at the same time. We can quote tempting prices on these Skylights, which have been used on some of the largest jobs in Canada.

Write us about our ACORN system, and we will send you literature telling all about our Skylights.

Metal Shingle & Siding Co.
Limited
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"Galt" Expanded Steel Lath

IS FLAT

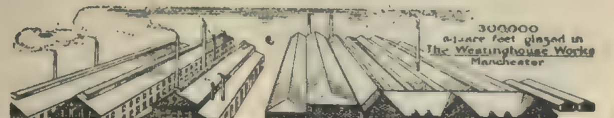
Don't confuse "Galt" Lath with the old fashioned, baggy metal laths that are still used on some buildings because a fire-proof lath is required and the Architect or Plasterer doesn't know that a **flat** lath is made.

Every sheet of "Galt lath is flat - no buckles, no bags, no bulges, no bad ends, no waste.

The process of manufacture makes each sheet **flat** and **rigid** as a board. The strands are corrugated and provide a "key" that holds plaster on walls or **ceiling.**

We wish you'd investigate this Lath matter while you have it in mind. Samples and full particulars of "Galt" Lath will not cost you a cent or place you under any obligation. Do you want them?

The Galt Art Metal Co., Ltd.
Galt, Ontario
Winnipeg — The Winnipeg Supply Co.
Toronto — W. D. Beath & Son



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A modern necessity in Factories, Stores, Banks, Offices, Gymnasia, Colleges and Public Institutions.

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They are made of sheet steel, with expanded metal or solid steel doors; key or combination locks; solid steel partitions and backs. D.L. Standards are the best locker value ever offered in this country.

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Towns and Cities

making extensions to, or installing systems of Water Works, should send us their inquiries regarding Hydrants, Valves and Valve Boxes.

We are specialists in the manufacture of these goods and our prices are right.

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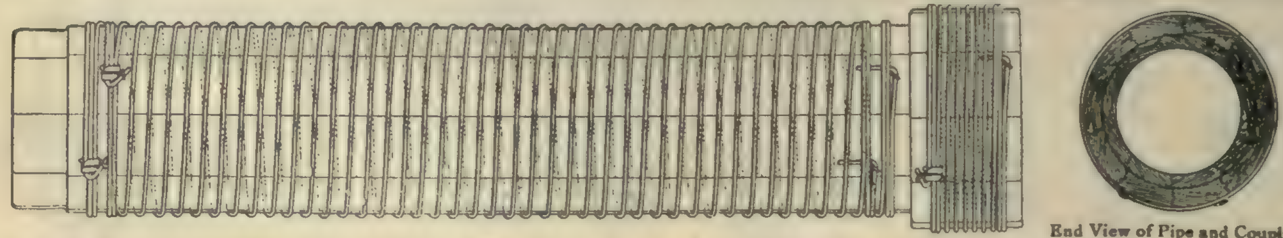

End View of Pipe and Coupling.

The Dominion Wire Wound Wood Water Pipe

Showing special method of winding with two independent parallel wires. The great advantage of this is that in event of one wire becoming damaged the pipe still retains a factor of safety of 2.5. Made only by

The Dominion Wood Pipe Company, Limited New Westminster, B.C.

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Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

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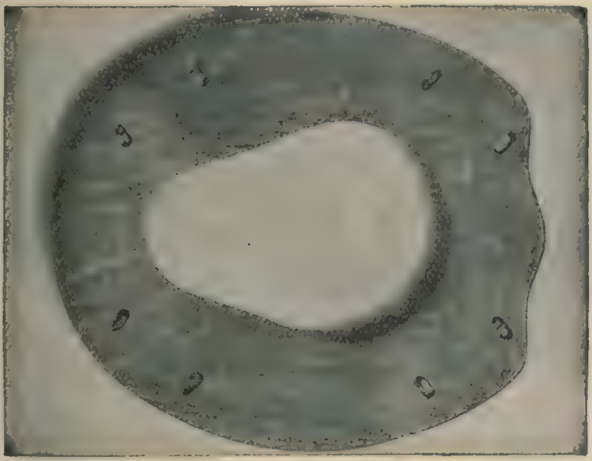
HAMILTON, ONT.

"Never-Split" Seats



The ordinary closet-seat depends on glue alone to hold it together at the joints. The **"Never-Split"** seat is held by iron bolts and nuts sunk into the wood. They are the most lasting form of closet-seat construction by virtue of the vise-like grip of the bolts.

"Never-Split" seats embody all the style, beauty, sanitary perfection and lasting qualities that it is possible to put into them. We are sole manufacturers of this line for Canada.

Order through your jobber or supply house, but always specify our goods. Catalogues on application.

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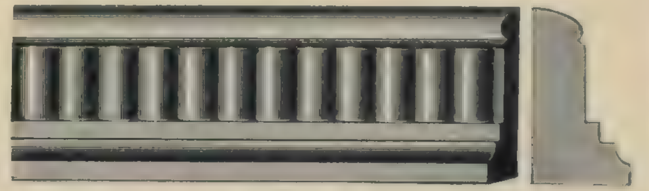
Artistic Decoration Gives Character



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Mouldings

will have a truly artistic finish.

We have a large variety of patterns, and woods from which to make selection.

Many of our Mouldings are carried in stock. Any requirement not to be found in stock can be made to order.

We are in a position to fill all orders quickly.

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For Concrete Construction, Roadways and Sidewalks, we carry a Light Weight Stone, specially suited for **Reinforced Construction Work.**

Our Roadway Stone is best on the market for Roadway Work, having those Qualities esssential for this Class of Work.

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Try a firm that can supply everything in the line of building material, and save trouble, time and money by dealing in one place.

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Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Barrie, Ont.
The special committee of the council have reported in favor of submitting a bylaw to raise $30,000 by debentures for sidewalks and sewers.

Cobourg, Ont.
Tenders are called for construction of cement sidewalks and street crossings. (See advertisement.)

Fernie, B.C.
G. H. Boulton, City Clerk, gives notice of the city's intention to construct a large number of wooden sidewalks as local improvements.

Hirsch, Alta.
The C. P. R. is installing a pumping station equipment, consisting of a Hornsby oil engine direct connected to a 3-throw plunger pump.

Hull, Que.
City Engineer Farley has submitted estimates on the cost of extending the waterworks system. He places the figure at $18,000.

Montreal, Que.
The Roads Committee have decided to call for tenders for the construction of an asphalt plant. Estimated cost $27,500.

Nanton, Alta.
Galt & Smith, consulting engineers, Toronto, have been engaged to report on a sewerage disposal scheme for the town.

Outremont, Que.
Tenders were recently opened by the Council for 30,000 feet of concrete sidewalks.

Owen Sound, Ont.
Tenders will be received by Waterworks Committee for water pipe and cement. (See advertisement.)

The Water Works Committee will ask for tenders for supplies needed in the extension of the system.

The ratepayers have approved a bylaw to raise $125,000 for the extension of the water works and the installation of a filtration plant at Inglis Falls.

Prince Rupert, B.C.
The provincial government and the G. T. P. are arranging to install a new waterworks system here.

St. Boniface, Man.
An extensive programme of local improvements has been drawn up by the City Engineer. Pavements, sidewalks, water mains and sewers, to cost $250,000, are included.

Toronto, Ont.
Tenders have been submitted in connection with the filtration plant. Fifteen in all were sent in. About six of these were for the construction of the plant and the rest for various supplies. The tenders have been referred to the engineer.

Trenton, Ont.
Tenders will be called June 1st for construction of municipal waterworks system. A producer gas plant will be employed. Willis Chapman, 103 Bay street, Toronto, is the engineer.

Vancouver, B.C.
Steps towards providing the municipalities of South Vancouver, Point Grey, Burnaby and Richmond with water have been taken. Messrs. Cleveland & Dutcher have received instructions to survey and report estimates on the construction of an intake and pipe line from Seymour Creek to the above districts. The combined water rights of these districts amount to 800 miners' inches, a quantity sufficient to supply over 100,000 persons. It is roughly estimated that the cost of the new undertaking will amount to about $400,000. Messrs. Cleveland & Dutcher will commence the survey at once, and if the plans are approved, construction will start next spring.

Victoria, B.C.
The ratepayers will vote on a by-law authorizing the raising of $125,000 for waterworks improvements.

The Provincial Government will install a new water system at Prince Rupert. At the present time negotiations are in progress with the G. T. P. with regard to the financial end of the matter.

Welland, Ont.
The town has sold $23,600 4 1-2 per cent. 10-year sewer debentures and $20,642 4½ per cent. 20-year sidewalk debentures.

Westmount, Que.
The City Council have passed the third reading of a bylaw authorizing the borrowing of $300,000 for permanent street improvements. It is proposed to expend this amount as follows: To cover expenditures already made for the construction of sidewalks and crossings, $13,222; construction of new sidewalks of granolithic or other permanent material, $63,875; kerbs and channels of concrete or other permanent material, $46,157; street crossings of brick, stone or other permanent material, $6,941; drains and main sewers, $28,223; macadamizing or paving of streets, $46,695; paving streets in asphalt, stone or other permanent material, $65,083; opening new streets and widening, prolonging or otherwise altering existing streets, avenues or public ways, for the purpose of providing drainage or for purchase of land for public use, $20,000; contingencies and expenses, $10,000.

AWARDED.

Berlin, Ont.
The Light Commission recently opened tenders for wrought and cast iron pipe for new gas mains and extensions. Seven tenders were received for 4 inch pipe, and that of P. Hymmen & Company, Berlin, was the lowest, $27.24 2-5 per 100 feet. The tenders ran up to $28.25 per 100 feet. There were three tenders for the six inch cast iron pipe, and the lowest was $48 per 100 feet. The highest tender was $50.25. The successful tenderer was the Gartshore-Thompson Company, Hamilton.

Burlington, Ont.
Contracts for the waterworks system were awarded last week. Willis Chipman, 103 Bay street, Toronto, is the engineer.

Hamilton, Ont.
The following tenders were received by the sewer committee for the Barton street sewer; John Armstrong, $1.20 a foot; Andrew Mercer, $1.38; City Engineer, $1.37½. The contract was awarded to J. Armstrong.

Toronto, Ont.
The successful tenderers for the filtration plant are as follows: Dill, Russell and Chambers, Toronto, main contract, $568,-128; Canada Foundry Company, Toronto, cast iron pipe, $10,891; Ludlow Valve Company, gate valves, $8,772; Coffin Valve Company, sluice valves, $5,209; John Inglis Company, Toronto, venturi meter castings, $2,891; Jno. MacDougall, Caledonian Iron Works, Montreal, indicating apparatus, $3,318; Canada Foundry Company, sand washer castings, $871; John MacDougall, Caledonian Iron Works, steam pumps, $9,-484; Allis-Chalmers-Bullock Company, screw pumps, $7,049; Allis-Chalmbers-Bullock Company, electrically driven stage pumps, $5,234; John Inglis Company, drainage pump, $1,600; John Inglis Company, boilers, $2,750; Canada Foundry Company, manhole castings, $8,890. The total cost of the plant will be $635,089, or about $100,000 less than the estimated cost. The contracts were awarded according to the recommendations of Mr. Allen Hazen, New York, and the City Engineer, and the lowest tenderer was not accepted in each case.

Victoria, B.C.
The following tenders for material required in the installation of the high pressure system have been accepted: Fine wire, Hawkins & Hayward, 18 1-2 cents per lb.; stempipe line, Marine Iron Works Company, $350; water suction connections and valves, Marine Iron Works Company, $450; condensing equipment, tender not awarded though the apparatus offered by the Hutchinson Bros. Company, the lowerest tenderers, at $1,750, is recommended.

Winnipeg, Man.
Contracts for sidewalk construction have been awarded by the city as follows: Granolithic walk, north side of Inkster avenue, Main to Scotia street, Engineer of Construction, $1,436; granolithic walk, north side of Redwood avenue, Main street to Aikins street, Thos. Jackson & Sons, $918; granolithic walk, south side of Redwood avenue, Main to Charles street, Engineer of Construction, $325.08; granolithic sidewalk, north side of Logan and Owen avenue, to Reitta, Engineer of Construction, $87.20; granolihtic walk, north side of Logan avenue, Nena to Owena street, Engineer of Construction, $806.40; granolithic walk, south side of McDermot avenue, Emily to Monkman street, Thos. Jackson & Son, $8720; granolithic walk, south side Macadam avenue, Mae street to end, Engineer of Construction, $478; cedar block

pavement of College avenue from Andrews to McGregor, Edwin Doidge, $2,533.76; block pavement on lane between Furby, Langside, Buell and Preston, Edwin Didge, $1,991.13; granolithic walk, east side of Powers, College to Mountain avenue, Thos. Jackson & Son, $527; granolithic walk, south side Anderson avenue, Main street to Aikins street, Galbraith Bros., $1,139.

Railroads, Bridges and Wharves

Kenora, Ont.
The Ontario Legislature has granted 1,000 acres of land a mile in aid of the construction of a railway through Kenora, northerly to the National Transcontinental Railway, by the Lac Seul, Rat Portage & Keewatin Railway.

Moose Creek, Ont.
The G. T. R. intend shortly to commence operations on the new station to be built here. The engineers were over the ground this week.

Nottawa, Ont.
Tenders addressed to J. Jardine, reeve of Nottawasaga Township, will be received until June 1st for the construction of a reinforced concrete arch bridge over Shirk's Creek. Plans and specifications at office of John Wilson, architect, Collingwood.

North Toronto, Ont.
The town asks tenders for concrete bridge and retaining walls in Davisville avenue. Plans prepared by Walter Brooke, Toronto, engineer. (See advertisement.)

Oak Bay, B.C.
The council have appointed a committee consisting of Councillors Newton and Macgregor, and the engineer, to report upon the project of building a municipal wharf.

Ottawa, Ont.
The C. P. R. have started operations on the Wellington street viaduct. It is to cost $75,000, and will be finished by July.

The G. T. R. are negotiating for the purchase of Cassidy's land along the River Rideau.

St. Jean, Man.
Tenders addressed to R. Rogers, Minister of Public Works, Winnipeg, Man., will be received until May 31st for the erection of a steel bridge on reinforced concrete piers and abutments over Plum Coulee. Plans and specifications may be seen at office of Chief Engineer, Department of Public Works, Winnipeg.

Toronto, Ont.
The Provincial Government has voted a cash subsidy of $3,000 a mile in aid of construction of the northerly extension for 15 miles of the Central Ontario Railway line now terminating at a junction with the Canada Atlantic Railway between Whitney and Madawaska stations. Construction has to be started within three months and completed within two years.

Tilbury, Ont.
Tenders addressed to A. Farquharson, Clerk, Tilbury East, will be received until June 1st for the construction of a bridge 60 feet span, with concrete abutments, steel top and covered with three inch white oak plank. Separate tenders will be received for the concrete work. Plans and specifications on application.

Winnipeg, Man.
Tenders addressed to the Chairman of the Board of Control will be received until May 29th for the supply of material and supervision of erection of mechanically worked horizontal swing gates for the Redwood avenue bridge. Plans and specifications may be obtained at office of City Engineer Ruttan.

The Transcontinental Railway Commissioners are preparing to file the plans of their route through the city with the civic officials and the Railway Department. As soon as these have been approved by the city and the Railway Commission construction will be proceeded with.

Warick, Ont.
Tenders addressed to R. Auld, Reeve, will be received until May 29th for the erection of a steel and concrete bridge over Brown's Creek; also for two other bridges.

Wellington, N.B.
Tenders addressed to John Morrissy, Chief Commissioner, Department of Public Works, Fredericton, will be received until May 31st for the construction of the masonry sub-structure and approaches of the Black River mouth bridge. Plans and specifications may be seen at the Department at Fredericton and on application to T. J. Bourque, Richibucto; J. Sheridan, St. Frances, and McLaughlin Bros., Buctouche.

AWARDED.

St. Thomas, Ont.
The following contracts have been awarded for bridge and culverts in Yarmouth: McKellar bridge, Ira Peer, $725; Carr bridge, J. W. Chivers, $1,500; Hepburn culvert, Powells and Gunning, $167; O'Brien culvert, Powells and Gunning, $183; Taylor culvert, Ira Peer, $327; Sommerville culvert, Joseph Vincent, $300; school house culvert on the L. & P. S. gravel road, Powells and Gunning, $263; New Sarum bridge, C. C. Stafford, $839.

Winnipeg, Man.
The contract for repairing the Lonise bridge has been awarded to Edwin Doidge at $595.

Contracts have been let for the construction of 414 miles of new line for the Canadian Northern Railroad. The Cowan Construction Company and the Northern Construction Company were awarded the work. The most important of the new lines is an extension from Vegreville to Calgary, 235 miles. Other new branches are: An extension from Maryfield, Sask., southwesterly one hundred miles; Goose Lake extension, sixty-five miles west from Saskatoon; extension from Russell westward twenty-five miles; from Prince Albert, thirty miles west; from Ochre River, through St. Rose du Lac, a distance of twelve miles, a branch line twenty miles north; from Oak Point, a branch twenty miles north from Morinville. A contract was granted to N. K. Boyd for an extension of the Wakopa line, twelve miles west.

Public Buildings, Churches, Schools, etc.

Brantford, Ont.
Tenders are asked for labor and materials for addition and alterations of church building. (See advertisement.)

Dauphin, Man.
Tenders for the erection of a twelve-room school building will be received until May 28th. J. H. Bossons, architect.

Plans for the new school building to be erected here have been completed by Architect Sinclair, of Brandon, Man. Tenders are now being taken.

Duck Lake, Sask.
Tenders addressed to P. Sache, Secretary, School District, will be received until May 31st for the erection of a school building on Section 8, Township 43.

Elora, Ont.
Tenders addressed to Henry Clarke, Village Clerk, will be received until June 2nd for the erection of a library building in this village. Plans and specifications may be seen on application to Mr. Clarke.

Elva, Man.
Architect Sinclair, of Brandon, Man., is preparing plans for a new Presbyterian church to cost $5,000.

Fernie, B.C.
Several new churches are planned for erection this season. The Presbyterians expect to spend about $12,000 on a new building, plans for which have already been received. The Church of England are putting in a foundation for a new edifice, but contracts for the construction of the building have not yet been awarded. It is stated that a fine church is planned for erection by the Roman Catholics, and the Baptists will erect a brick church at a cost of $5,000. Tenders for the Baptist church will be called for in a few weeks.

Guelph, Ont.
The G. T. R. are taking steps to comply with the order of the Railway Commission for the erection of a new station at this place.

It has been decided to award contracts for the proposed $50,000 addition to the Winter Fair Building. Work will be commenced as soon as the agreement with the Government is signed.

Halifax, N.S.
The City Council have donated a site adjoining Dalhousie college for extensions to the university.

Hamilton, Ont.
The directors of the Y.M.C.A. will endeavor to raise $50,000 for a new building for the boys and for repairs to the present building. A. Powis is president of the association.

Joliette, Que.
Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until May 28th for the installation of a hot water heating system in the armory at this place. Plans and specifications at office of A. Durand, architect, Joliette, Que., and at the Department of Public Works, Ottawa.

Montreal, Que.
The Y. M. C. A. building on Dominion Square is to be remodelled and a new structure erected at a cost of about $200,000.

A new branch Y. M. C. A. building will be erected in the northeast end of the city at an estimated cost of $50,000.

The old Royal Arthur school, corner of Workman and Canning streets, which was practically destroyed by fire last January, is to be replaced by a modern structure to cost $75,000. Competitive plans have been invited for the new building, and will be received until June 9th. Address the Secretary, Protestant School Board Commission.

Oshawa, Ont.
Funds are being raised for the erection of a new Y.M.C.A. building.

Ottawa, Ont.
The First Congregationalists contemplate the erection of a new building.

It is stated that a new five or six storey masonic temple will be erected along side the Y. M. C. A. building next spring.

Owing to a disagreement which has arisen as to the site for the proposed new school building in Ottawa South, the Building Committee have postponed the taking of tenders.

Quebec, Que.
The emigration buildings on the Louise embankment were badly damaged by fire last week.

St. Thomas, Ont.
Grace Church congregation are raising funds for the erection of a new building and will soon be ready to let contracts.

Toronto, Ont.
The Y. M. C. A. are discussing enthusiastically the matter of erecting a new building. G. A. Warburton is secretary.

Vancouver, B.C.
The Vancouver Exhibition Association have adopted Mr. Henry Watson's plans for the new exhibition buildings from among six plans, submitted in competition. The building will be 240 long and 100 feet wide, and will cost $25,000.

Victoria, B.C.
J. C. M. Keith, architect, has received instructions from the School Board to proceed with the drawings and specifications of the new Moss street school. The cost will be approximately $38,000 to $40,000, exclusive of $6,000 for heating.

Welland, Ont.
The ratepayers have defeated a bylaw to raise $10,000 for the erection of a public school.

Westmount, Que.
A new $50,000 Y. M. C. A. building will be erected here this season.

Westport, N.S.
Tenders addressed to C. J. Desbarats, Acting Deputy Minister of Marine and Fisheries, Ottawa, Ont., will be received until June 15th for the construction of a wooden lighthouse tower on Peter's Island, Grand Passage, near this place. Plans and specifications at the Department at Ottawa, at the Agency of the Department at Halifax, and at the postoffices at Westport, Digby and Yarmouth.

Winnipeg, Man.
It is stated that arrangements are being made for the erection of a new Presbyterian church in the northwestern section of the city this summer.

The new western telephone exchange will be located on Portage avenue near the Deaf and Dumb Institute. The building will cost $30,000 and will be completed this year. Preparations are also in hand for a north exchange. Property for this purpose is now held at the corner of Salter and Burrows.

F. J. Russell, architect, has prepared plans for the erection of a Methodist kindergarten school, corner of Powers and Stella avenue.

A permit has been issued for the new Baptist church to be erected on Nassau street. Estimated cost $26,000. Architect, G. G. Teeter; contractors, Fraser & McDonald.

AWARDED.

Cranbrook, B.C.
The City of Cranbrook has let a contract for the erection of a new school to cost $37,937.

Ottawa, Ont.
The contract for the brick and stone work required in the construction of the School Board's new room in the Elgin street school, has been awarded to A. Garvock at $1,980. Geo. Crain tendered at $2,075. Carpenter work will be done by day labor.

Portage La Prairie, Man.
The contract for the construction of the new Presbyterian church at Burnside has been awarded to Bedman & Oburn, of Portage, at $2,397.

Victoria, B.C.
The contract for the erection of the Christian Scientist Association's new hall has been awarded to R. Hetherington at $4,400. D. C. Frame, architect.

Residences

Oak Bay, B.C.
Permits have been issued to the following; D. R. Elcorn, dwelling, Hampshire road, $2,500; M. Carlin, dwelling, Cadboro' Bay road, $2,950; M. Carlin, dwelling, Empress street, $2,950.

Peterborough, Ont.
Permits have been issued to A. Kidd for a brick veneer dwelling on Lock street to cost $2,250; and to W. Taylor for a cement block dwelling on George street to cost $2,100.

Vancouver, B.C.
C. R. Oldershaw has plans for a residence for W. C. Spearman.

Mrs. C. R. Richardson will build a modern residence, corner of Harwood and Bidwell streets. R. Fripp, architect.

A new residence will be erected on Tenth avenue by Mr. B. Russell. Architect, C. H. Allan.

Winnipeg, Man.
Recent building permits include: Smith, Tapley & Dow, five houses, between Salter and Powers, $6,000; John Douglas, house, Home street, between Wellington and Sargent, $2,500; Harrison and Mackay, house, Lipton, between Portage and Livinia, $2,000; H. Hirsh, house, between Main and Mac, $3,200; H. P. Coverdale, house, Mountain avenue, $3,600.

F. J. Russell, architect, has completed plans for the Crichton apartment building on Edmonton street. This will be a solid brick structure three storeys high with stone and brick front. The same architect has plans in hand for a residence on Balmoral Place for Mr. A. N. MacPherson, and a brick residence on Crescent road, Fort Rouge, for Mr. A. C. MacRae.

D. W. Bellhouse, architect, this city, is preparing plans for a red brick and half timber residence on Academy road for Mr. W. G. Styles; estimated cost $7,000. Mr. Bellhouse is also preparing sketches for several private houses and two large blocks; in additon he has completed plans for a residence on Preston avenue for Mr. W. Armstrong to be of red brick, hardwood finish throughout, cost $6,500.

The Lancaster Apartment Company are erecting an apartment block on the north side of Spadina avenue at the south end of Rose street, to cost $35,000. Hinds & Mitchell, contractors; T. W. Northwood, architect.

Dunn & Wallace will erect a dwelling on Arlington street, south of Portage avenue; cost $2,800.

Meirowitz & Cohen Bros. have a permit for a double cottage on Salter street, between Redwood and Aberdeen avenues; cost $2,000.

Dunn & Wallace will build a dwelling on Spence street, south of Broadway; cost $5,000.

G. Thomas will build three cottages on Polson avenue, between West and Aikins streets; cost $3,000.

W. T. Carson has a permit for a dwelling on Walnut street, between Preston and Broadway avenues to cost $4,000.

A. T. Shave will erect a dwelling on Bannerman avenue, east of Main street,; cost $2,000.

Recent building permits include: E. W. Andrews, two dwellings, Grosvenor avenue, $9,000; J. Isenberg, on Selkirk avenue between McPhillips and Van Horne, five cottages, $5,000; J. Isenberg, corner Bannerman and Salter, five dwellings, $7,000; J. Isenberg, Salter street, between Mountain and St. John, six dwellings, $9,000; G. J. Goodmundson, Victor street, between Ellice and Sargent, dwelling, $2,500; D. McRae, Jessie avenue, between John and Hugo, dwelling, $2,000; Wallace & Aikins, two dwellings, $8,500, Buell street, between Maryland and Walnut.

John Woodman, architect, has just taken tenders for the erection of a large apartment block at the corner of Hargrave and Cumberland. The building will be five storeys high, of reinforced concrete construction, and will cost $100,000.

Business Buildings and Industrial Plants

Barrie, Ont.
The ratepayers have approved a bylaw granting a loan of $40,000 to the Webber Engine Company, who will equip a foundry at a cost of $60.000.

Brandon, Man.
Johnson Bros. will build a new restaurant at a cost of $10,000.

Cranbrook, B.C.
The Maycock, B.C., Lumber Company's plant was recently destroyed by fire at a total estimated loss of $100,000.

Campbellford, Ont.
The Northumberland Pulp Company are asking the Seymour Township Council for a fixed assessment of $2,000 on a pulp mill which it is stated they will erect near Ronney Falls. The company ask for a fixed assessment for 10 years, and it is said will undertake to erect buildings and works at a cost of $10,000. A by-law will be submitted to the electors on June 21st.

Dunnville, Ont.
The Erie Woollen Mills, owned by John Slingsby, were destroyed by fire last week. Estimated loss, $12,000.

Edmonton, Alta.
Permits have been issued to Rolfe & Kenwood for the erection of stores and offices on First street at a cost of $20,000, and to the Twin City Manufacuring Company for a $15,000 factory and warehouse.

Fernie, B.C.
The Imperial Bank will shortly start upon the construction of a new building.

Fredericton Junction, N.B.
L. B. Smith's saw mill at Baillie station, three miles from this place, was destroyed by fire last week at an estimated loss of $4,000.

Fort Frances, Ont.
E. W. Backus, who is interested in the establishment of a pulp mill here, was recently in town and stated that a company,

who formerly operated a large flour mill at Montevideo, Minn., and who had lost everything by fire, were thinking of locating in Fort Frances if satisfactory freight rates could be obtained from the C. N .R.

Ingersoll, Ont.
The Reid Foundry & Machine Company's building was totally destroyed in a recent fire.

Kamloops, B.C.
The Board of Trade is negotiating with the C. P. R. with a view to securing the establishment of large engine shops.

Montreal, Que.
It is stated that a contract has been let for a $15,000 hotel at St. Lambert.

The St. Gabriel church property has been sold to J. A. Jacobs, who will erect a nine storey business building on the site.

The Canada Lead Works, owned by the James Robertson Company, Limited, were destroyed by fire last week at a loss of $250,000.

Peterborough, Ont.
The Canadian Chiclet Company are said to be contemplating extensions to their factory.

Portage la Prairie, Man.
The Waterloo Manufacturing Company will shortly start work on their proposed new building. R. C. Kells is local manager.

Sydney, N.S.
C. E. Derrick, of Montreal, is interested in the establishment of rolling mills at this place.

Sherbrooke, Que.
The by-law granting the Structural Steel Company a free site for the erection of a factory and exemption from taxation has been passed by Sherbrooke ratepayers. The company will erect a plant valued at $25,000.

Toronto, Ont.
Tenders close this week for new Bell Telephone exchange buildings in St. Thomas, Berlin and Sault Ste. Marie.

The premises of the Peerless Carbon & Ribbon Manufacturing Company, Limited, 176 Richmond street west, were damaged by fire last week.

Vancouver, B.C.
G. E. Bower, of this city, plans the erection of an eight storey fireproof office building on Granville street. Estimated cost $125,000. Architects, Hooper & Watkins.

Plans are being made by Frank Huston for the construction of a saw mill and planing mill in Vancouver. Both mills will be operated by electricity.

Welland, Ont.
The property of the Whalley house and A. Griffiths was damaged by fire last week at a loss of about $6,000.

Winnipeg, Man.
The Oxford Hotel will be altered at a cost of $3,000. F. Lindsay, proprietor.

The Gee Whiz Manufacturing Company have obtained a permit for the erection of a $6,000 warehouse on Henry avenue.

G. G. Teeter, architect, is taking tenders for the erection of a large warehouse at the corner of Lulu and Henry avenue for the Knechtel Furniture Company. The building will be 120 by 50 feet, with three floors and basement.

AWARDED.

Winnipeg, Man.
Charles W. Sharpe & Company have been awarded the contract for the erection of a building for the Great West Life Assurance Company. The contract price is $170,000, and the successful tenderer was the lowest among the seven who figured. The entire cost of the building is expected to be $230,000. It will be of steel frame construction and entirely fireproof with porous tile terra cotta partitions. The exterior will be of British Columbia marble.

Power Plants, Electricity and Telephones

Altona, Ont.
The Central Telephone Company has been incorporated here, with a capital of $40,000. J. Underhill is secretary.

Apsley, Ont.
The Apsley Telephone Company has been incorporated with a capital of $10,000 by D. Brown, Z. Tucker, of Apsley, and D. Davidson, of Peterborough, Ont.

Abernethy, Sask.
The Foster Rural Telephone Company has been incorporated with a capital of $5,000.

Buckingham, Que.
Plans are being prepared for the extension of an electric car line between Masson and Buckingham.

Broomhill, Man.
The municipality of Albert has voted in favor of a municipal telephone system. For further information address W. Kilkinny, Broomhill, Man.

Carslbad Springs, Ont.
The Gloucester Township Telephone Association, a newly formed organization, has been granted permission to erect a line from Carlsbad Springs along the Russel road. A. Childs, of Carlsbad Springs, is president, and J. O. Hodgson, secretary.

Cobourg, Ont.
The council has granted the Provincial Steel Company permission to build an electric railway from its plant to the lake front. The Cobourg, Port Hope & Havelock Electric Railway Companies have also been given permission to enter the town.

The Cobourg, Port Hope & Havelock Electric Railway Company has been incorporated to construct an electric railway to extend across Northumberland County to Warkworth and Campbellford, thence to Havelock, with branches from a point near Warkworth to Roseneath and Hastings, by H. T. Bush, E. S. Huycke, of Port Hope; W. J. Crossen, of Coburg, and Reeve J. Knox, of Havelock. H. A. Ward, of Port Hope, is secretary.

Glencoe, Ont.
The town is installing a 100 horse power Hornsby-Stockport suction gas engine unit for street and domestic lighting.

Hamilton, Ont.
The city has accepted the offer of the Hamilton Electric Light & Power Company to furnish electricity for the illumination of Gore Park and extension from May 24 until September 30 for $550.

London, Ont.
Tenders will shortly be called for the supply of wires, insulators, cross-arms, poles, etc., for the distribution system in connection with the Hydro-Electric Power Commission project. For further information

Lethbridge, Alta.
The provincial government will start work immediately on the new telephone exchange here. A two storey brick building will be erected and all modern conveniences installed.

Montreal, Que.
Lamontagne Limited, of Montreal, have just installed two 50 horse power Hornsby-Stockport suction gas units, driving two direct current dynamos for lighting and power.

The Dominion Government is now considering the electrification of the Intercolonial Railway from Montreal to Moncton, N.B. The water power at Grand Rapids will be developed to furnish electricity to operate the railway if the plan is carried through. D. Pottinger, Moncton, N.B., is general manager.

New Hamburg, Ont.
The Metropolitan Railway Company, it is reported, contemplate constructing a railway which will extend from Stratford to Guelph.

The town has decided to purchase $20,000 in capital stock of the People's Railway Company, which is capitalized at $1,000,000. Other municipalities will be asked to take stock in the company.

New Glasgow, N.S.
The plant and franchises of the New Glasgow Electric Light Company have been transferred to the Egerton Tramway Company.

Odessa, Ont.
The Ernestown Telephone Company, with main office in Odessa, has been incorporated. For further information address J. F. Dawson.

Portage la Prairie, Man.
A new telephone exchange building, 40 x 80, will be erected, and will cost $20,000. It will accommodate a modern central energy switchboard with a present capacity of 1,400 subscribers which can be increased when required to 5,000 subscribers. The construction department under the telephone commission will carry on the building of rural lines in Oakville, Mill Creek, Poplar Point, High Bluff, Flea Island, Oakland, Longburn, Westbourne, Macdonald and Burnside, all of which get connection with Portage la Prairie exchange.

The Manitoba Power & Electric Company has been incorporated with a capital of $100,000. The provisional directors are: W. H. Carter, A. H. Aldinger and A. J. Williams, of the Carter-Halls-Aldinger Company, Winnipeg, Man.

Rosewood, Ont.
At a meeting of the Rosewood Rural Telephone Company, of which G. Claydon is manager, it was decided to build a line to Ste. Anne.

Regina, Sask.
Tenders for the construction of the Estevan-Gainsboro-Alamea-Carlyle telephone line and for the Wapella-Esterhazy telephone line will be received until June 1st by S. P. Porter, Deputy Commissioner, Railways and Telephones, this city.

Stratford, Ont.
A proposition has been submitted to the city council by N. M. Cantin, of St. Joseph, on behalf of New York capitalists, offering to construct an electric railway between St. Joseph and Stratford, a distance of about 65 miles, upon condition that the city guarantee bonds of the company to the amount of $250,000.

Thamesville, Ont.

The Thamesville Telephone Company has been incorporated with a capital of $10,000. The provisional directors are: W. J. Mitton, Camden; T. Marven, J. Coutts, of Thamesville, Ont.

Vancouver, B.C.

The B. C. E. R. Company has called for tenders for the construction of about five miles of tram extensions and the bids will be opened at an early date.

Victoria, B.C.

The British Columbia Electric Railway Company, it is said, has been making investigations at Jordan River with the view of increasing its supply of power, and if negotiations are consummated with the city it will probably establish a new plant at a cost of about $2,000,000. It is estimated that 10,000 h.p. can be developed all the year around. The proposition calls for a series of reservoirs for the storage of surplus water.

Winnipeg, Man.

At the annual meeting of the Winnipeg Electric Railway Company it was decided to issue $1,500,000 in new stock for extensions and improvements to the system.

Long distance telephone lines are being arranged between the following points in the province: Giroux-La Broquerie; Steinbarch-St. Piere; Stonewall-Warren and Atwell; Souris-Pipestone; Narcoe-Moore Park; Shoal Lake-Oakburn; Strathclair-Elphinstone; Headingly-St. Francois Xavier; Hamiota-Miniota; Foxwarren-St. Lazarre; Dominion City-Stuartburn. Long distance circuits are being arranged from Portage la Prairie to Eustache, Sydney to Carberry, Kelwood to Gladstone via Neepawa, Virden to Brandon, Hartney to Deloraine, Souris to Wawanesa, Deloraine to Boissevain, Treherne to Cyprus River, Cartwright to St. John's, North Dakota; and Winnipeg to Shanawan. Circuits have already been erected from Browardise to Brandon, Morris to Morden, Killarney to Ninga, and Morris to Myrtle.

The telephone commissioners have completed plans for the season's programme of building and extensions which will mean the expenditure of $750,000 and the addition of 5,000 subscribers to the system in Manitoba. $250,000 will be spent in Winnipeg upon a new exchange for the western part of the city; for the extension of aerial and underground cables, and also the necessary extensions to be provided for the Main street and Fort Rouge exchanges. There will be $250,000 expended on rural lines, and $250,000 on long distance lines.

AWARDED.

Chatham, Ont.

The Chatham, Wallace & Lake Erie Railway Company have recently placed contracts for two Gould storage batteries.

Edmonton, Alta.

The contract for grading five and one-half miles of streets for street car line has been awarded to Lubbock and Matheson, whose tender was the lowest. The tenderers were Lubbock & Matheson, $1,925 per mile; Manders & Miller, $1,950 per mile; S. E. Patton, $2,985 per mile. The specifications call for the grading of the roadbed, laying of ties and steel ready for the rolling stock. The tender of the Globe Lumber Company, Revelstoke, B.C., for three cars of 35-foot poles and a double car of 40-foot poles was accepted. The following tenders were received for the structural steel for the new power house extension and for the elevated coal bins of 350 tons capacity. The prices are for completed steel work f.o.b. Edmonton, and erected on foundations—Can. Bridge Company, building $14,423, coal bin $3,198, total $17,621; Edmonton Ironworks, building $14,404, coal bin $2,365, total $16,460; Wisconsin Bridge Company, $16,460; North Supply Company, building $13,419, coal bin $4,600, total $18,019; Dominion Bridge Company, building $16,200; Edmonton Dis. Company, building $14,368, coal bin $2,400, total $16,768. The contract was given to the Edmonton Iron Works for $16,460. The purchase of a street railway water sprinkler from the Preston Car Company, Preston, Ont., for $2,740 was ordered.

Saskatoon, Sask.

The fire, water and light committee have awarded the contract for bricking boilers to H. F. Moore for the sum of $2,000.

Vancouver, B.C.

The British Columbia Electric Railway Company has awarded the contract for 390 miles of aluminum wire, which will be used for transmission purposes on the Chilliwack line. The tender of the Great Northern Aluminum Company of Montreal was accepted at $45,000. This company is a Canadian branch of the Pittsburg Reduction Company, and has its works at Shawinigan, Quebec.

Miscellaneous

Niagara Falls, Ont.

Tenders for $9,000 five per cent. 30-year school debentures of the township of Stamford will be received until June 7th by J. E. Jones, Clerk, Box 201, Niagara Falls South.

Port Arthur, Ont.

Tenders addressed to N. Tessier, Secretary, Department Public Works, Ottawa, will be received until June 2nd for dredging required at Fish Dock and the Thunder Bay Terminal Elevator Company's dock. Combined specifications and form of tender can be obtained at office of E. B. Temple, resident engineer, Port Arthur; J. G. Sing, resident engineer, Confederation Life Building, Toronto, and at the Department.

Victoria, B.C.

Fire Chief Davis has submitted a recommendation for additional hydrants and equipment.

Toronto, Ont.

The plans prepared by Mr. J. D. Sing for the reclamation of Ashbridge's Bay and the establishment of industrial sites with harbor facilities, was considered at a recent meeting of the special committee of the City Council. The plan provides for the filling in of 6,967 acres, the building of a channel about two miles long on the south of the new land, and of slips and docks on the bayside and along the channel. Mr. Sing said that it would give Toronto the finest harbor accomodation on the Great Lakes. The plan was referred to C. H. Rust, City Engineer; Mr. Forman, Assessment Commissioner; Mr. Wilson, Park Commissioner; and Mr. Joseph Thompson, Commissioner of Industries, who will secure detailed information as to the probable cost of the work and report upon what action should be taken looking to the ultimate accomplishment of the plan.

Recent building permits include: T. Eaton Company, 2 storey brick addition to factory, Albert street, $18,000; J. J. Downey, 2 storey and attic brick dwelling, Sunnyside avenue, $3,000; J. W. Devitt, pair semi-detached 2 storey and attic brick dwellings, Palmerston avenue, $4,600; D. E. Smith, 2 storey brick dwelling, Rusholme road, $4,100; Mr. Whitehead, pair semi-detached 2 storey roughcast dwellings, brick fronts, DeGrassi street, $3,000; R. S. Wilson, 2 pairs semi-detached 2 storey roughcast dwellings, brick fronts, Frizell avenue, $8,000; H. W. Ireland, 2 1-2 storey brick dwelling, St. Clair avenue, $4,500; C. Coulter, pair semi-detached 3 storey brick stores and dwellings, College street, $6,000; J. S. Shaw, 3 storey brick store and dwelling, College street, $4,100; H. Carter & Company, pair semi-detached 2 storey brick dwellings, Follis avenue, $4,000; Mark Irish, alterations to dwelling, Chestnut Park road, $3,000; Chas. C. Fry, 2 storey and attic brick dwelling, near Alhambra avenue, Thorold street, $3,000; Wm. Crocker, alterations to bank, corner Palmerston avenue and Queen street, $3,000; Mrs. Lennox, 2 storey and attic brick dwelling, Bathurst street, $4,000; Edna M. Read, 2 1-2 storey brick dwelling, Indian Grove, $3,500; Wm. Hedderson, pair semi detached 3 storey brick stores and dwellings, near Sorauren on Dundas street, $10,000; F. A. Coryell, brick dwelling, Jameson avenue, $4,500; W. N. Tilley, two storey and attic brick dwelling, near St. Clair avenue, avenue road, $10,000; Andred Dodds, 2 storey and attic brick dwelling, corner Keele and Howard Park, $9,500; M. Rossiter, 2 storey brick store and dwelling, Queen street east, $3.600; A. E. Skinner, 2 storey and attic brick dwelling, Edgar avenue, $7,000; W. L. Symons, 2 storey and attic brick dwelling, corner of Dunvegan road and Lonsdale, $9,000; R. Dunn, pair semi-detached 2 storey brick dwellings, Brock avenue, $4,000; J. B. Fleming, pair semi-detached 2 storey brick dwellings, corner Borkeley and Sydenham, $4,500; F. Phillings, pair semi-detached 2 storey brick dwellings, Brunswick avenue, $5,000; H. J. & W. F. King, 5 attached 2 storey brick dwellings, near Lippincott, Herrick street, $10,000; Wm. Downs, pair semi-detached 2 storey brick dwellings, Massey, $3,600; John Edgworth, 2 detached 2 1-2 storey brick dwellings, Binscarth road, $8,800; Jason Shaver, 2 1-2 storey brick dwelling, Balsam, $3,500; T. H. Cooper, 3 detched 2 storey and attic brick dwellings, near St. Clair avenue, on Russell Hill Drive, $9,000; G. Rathbone, 3 storey brick store and apartments, Queen and Church streets, $35,000; E. Pringle, 2 storey and attic brick dwelling, Wright avenue, $4,000; E. G. Wilson, 2 storey and attic brick dwelling, and a garage, Lynwood avenue, $6,000; J. E. Peterkin, pair semi detached 2 storey brick dwellings, Galley avenue, $4,000; J. J. Downey, 2 storey and attic brick dwelling, Sunnyside, $4,000.

Business Notes

Recent British Columbia incorporations include: Howe Sound & Northern Boom Company, Limited, capital $50,000; Canyon City Lumber Company, Limited, capital $150,000; Larson Timber Company, Limited, capital $500,000.

The total aggregate for new buildings in Victoria, B.C., during April was over $200,000, which beats the previous record for this month. The total for the first four months of the year was $500,000, an increase of $130,000 over the first four months last year.

The Calgary Street Paving Company has contracted to purchase the asphalt output of the British Columbia Refining Company till the end of December. The oil company's plant is now under construction. One half of the company's plant will be oil and the other half asphalt.

Tenders and For Sale Department

For Sale

123 Sewer Braces, also one 6″ Centrifugal Pump Box 741, CONTRACT RECORD, Toronto. 21

Tenders for
Cement Walks

will be recived by the undersigned until MONDAY, THE 31ST MAY, current at 7 p.m., for the Construction of Five Thousand Dollars worth of Cement Sidewalks and Street Crossings.

The lowest or any tender not necessarily accepted.

For particulars address

D. H. MINAKER,
Town Clerk.

Coburg, 18 May, 1909. 21

Tenders Wanted

Tenders for the labor and materials required in the erection of all or any of the several branches of work, necessary to complete proposed additions and alterations to the Colborne Street Methodist Church building, Brantford, Ont., will be received up till 12 o'clock noon, SATURDAY, JUNE 5, 1909.

Plans and specifications may be seen at the office of the Architects.

All tenders shall be sealed, marked "Tender" and addressed to W. J. Verity, Brantford, Ont.

The lowest or any tender not necessarily accepted.

TAYLOR & TAYLOR, Architects,
Hope Chambers, Brantford, Ont.
21

Tenders for Bridge

Sealed Tenders, whole and separate, for substructures and superstructures for the several bridges proposed to be erected in the following places in the Province of Ontario endorsed, "Tenders for Bridges," addressed to the undersigned, will be received at this Department until noon on TUESDAY, JUNE 1ST, 1909:—

Wabigoon River, at Dryden—Steel superstructure on concrete abutments or **Reinforced Concrete Arch.**

Vermillion River, at Whitefish—Steel superstructure on concrete abutments.

Burnt River, Township of Snowdon—Steel superstructure on concrete abutments or **Reinforced Concrete Arch.**

Spanish River, Township of Nairn—Steel superstructure on concrete abutments.

Murdoch River and Courchace Bay, Township of Bigwood—Two timber bridges.

Rossport, District of Thunder Bay—Concrete culvert and earth filling.

Plans and specifications may be seen and forms of tender obtained at this Department, at the offices of Mr. A. L. Quartermain, Architect, Kenora; Mr. A. L. Russell, Civil Engineer, Port Arthur, and Messrs. Demorest, Stull and Lowe, Civil Engineers, Sudbury

An accepted bank cheque payable to the order of the Hon. J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender and the bona-fide signatures and addresses of two sureties, or the bond of a Guarantee Company, approved by this Department, must accompany each tender.

The Department will not be bound to accept the lowest or any tender.

By order,
H. F. McNAUGHTEN,
Secretary of Public Works.

Department of Public Works, Ontario,
Toronto, May 15th, 1909.

Newspapers publishing this advertisement without authority will not be paid for it. 21

Proposals

The City of Toronto will shortly call for tenders for the laying of about 300,000 duct feet underground conduit.

For specifications, apply to the Electrical Department, City Hall. tf

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Wanted

A firm in United States manufacturing knife switches, switchboards, panel boards, fuse block on a large scale, wishes to secure representation in both Eastern and Western Canada. Address

Box 770,
CONTRACT RECORD,
Toronto.
21

City of Moose Jaw, Sask.

Tenders For
Laying Sewer and Water Mains

Sealed tenders addressed to Alderman Matthews, Chairman, Water and Sewer Committee, City Hall, Moose Jaw, will be received in the Council Chamber, up to 8.30 p.m., MONDAY, MAY 31ST, 1909, for Labor and certain Materials in connection with laying approximately 15,000 feet of 8″ tile Sewer and 6″ C.I. Water Main, Manholes, Etc. The lowest or any tender not necessarily accepted.

Plans and Specifications can be seen in the office of the undersigned.

J. DARLINGTON WHITMORE,
City Engineer.
City Hall.
21

Town of Pembroke, Ont.

Tenders for
Electric Motor and Pump

Tenders will be received up to and including, TUESDAY, JUNE 1ST, by James P. Sarsfield, Chairman of the Water Works Committee, Pembroke, for one Turbine Pump direct connected to a two-speed wire wound Motor mounted on one base. Pump to be capable of delivering twelve hundred, (1200) imperial gallons per minute against 210 feet and 320 feet respectively. The suction lift at extreme low water will be 25 feet to centre of shaft. The guaranteed efficiencies of pump and motor at half, three-quarter, and full load on each speed to be submitted with tenders.

Pump to be erected on foundations provided by the town, and one spare impeller is to be supplied by the contractor, as is all necessary check valves, foot valves and ordinary valves.

Further particulars will be supplied by B. G. Michel, C.E., Town Engineer, Pembroke.

The lowest or any tender not necessarily accepted.

J. P. SARSFIELD,
Chairman, Water Works Com.
Pembroke, Ont.

Pembroke, Ont.,
May 14th, 1909. 21

Tenders for Repairs to
Concrete Gas Holder Tank

Sealed tenders addressed to H. B. R. Craig, City Engineer, and marked "Tenders for Gas Holder" will be received up to 12 o'clock noon, the 19TH DAY OF JUNE NEXT, for the repair of the Concrete Gas Holder Tank belonging to the Corporation of the City of Kingston, Canada.

Information and general specifications may be obtained upon application to the undersigned.

The lowest or any tender not necessarily accepted.

(Signed) H. B. R. CRAIG,
City Engineer. 22

CITY OF BRANTFORD

Tenders for Pavement

Sealed Tenders addressed to Ald. John Moffat, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock noon on

THURSDAY, JUNE 10TH, 1909

for the pavement of Queen and George Street:

(a) About 6,000 square yards of concrete foundation including grading.

(b) About 6,000 square yards of top surfacing, (tenders for different kinds will be received).

(c) About 3,000 lineal feet of concrete curb and gutter.

Separate tenders are required for a, b and c. A guarantee bond for the maintenance of the pavement for 10 years will be required

Plans and Specifications may be seen and Forms of Tender obtained at the City Engineer's Office.

Each tender must be accompanied by a marked cheque for 5 per cent. of the amount of tender.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer's Office, City Engineer.
City Hall, Brantford.
May 22nd, 1909. 22

Sealed tenders addressed to the undersigned, and endorsed "Tender for Wharfs at Mouth of Mission River," will be received at this office until 4.30 p.m., on FRIDAY, JUNE 4TH, 1909, for the construction of wharfs at the mouth of the Mission River, at Fort William, District of Thunder Bay, Ont. Plans, specification and form of contract may be seen at the offices of H. J. Lamb, Esq., Resident Engineer, London, Ont.; I. G. Sing Esq., Resident Engineer, Confederation Life Building, Toronto; W. P. Merrick, Esq., Resident Engineer, Fort William, Ont.; A. R. Decary Esq., Resident Engineer, Post Office, Quebec; J. L. Michaud, Esq., Resident Engineer, Merchants Bank Building, St. James St., Montreal, and at the department of Public Works, Ottawa.

Persons tendering are notified that tenders will not be considered unless made on the printed form supplied, and signed with their actual signatures, with their occupations, and places of residence. In the case of firms, the actual signature, the nature of the occupation and place of residence of each member of the firm must be given.

An accepted cheque on a chartered bank, payable to the order of the Honourable the Minister of Public Works, for thirty-five thousand dollars ($35,000) must accompany each tender. The cheque will be forfeited if the party tendering decline the contract or fail to complete the work contracted for, and will be returned in case of non-acceptance of tender.

The Department does not bind itself to accept the lowest or any tender.

By order,
NAPOLEON TESSIER,
Secretary.

Department of Public Works,
Ottawa, May 5, 1909.

Newspapers will not be paid for this advertisement if they insert it without authority from the Department.

CITY OF BRANTFORD

Tenders for Sewers

Sealed Tenders addressed to Ald John Moffat, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock noon on

THURSDAY, JUNE 10TH, 1909

for the furnishing and laying of about 6,000 lineal feet of sanitary sewers on Scarfe, Gilkison, Brant and Oxford Streets, 12 inch and 9 inch in diameter, together with necessary manholes.

Plans and Specifications may be seen and Instructions to Bidders and Forms of Tender obtained at the City Engineer's Office.

Each tender must be accompanied by a marked cheque for 5 per cent. of the amount of the tender.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer's Office, City Engineer.
City Hall, Brantford,
May 22nd, 1909. 22

Tenders for

Waterpipe and Cement

Sealed tenders, addressed to the Chairman Waterworks Committee, will be received up to 6 p.m. on SATURDAY, JUNE 5TH, 1909, for the following approximate quantities:—

Waterpipe	18 inch D.	3,000 ft.
	12 "	20,000 "
Lead		14 tons

Also Hydrants, Valves, Venturi Meters, Specials, &c.

Portland Cement		4,000 bbls.
Sewer Pipe	24 inch	1,100 ft.
	12 "	1,470 "
	9 "	2,400 "
	12 " split	264 "
	9 " "	80 "
	6 " "	1,600 "

Also Y's, T's, &c.

Specifications sent on application.

The lowest or any tender not necessarily accepted.

R. McDOWALL, C.E. JOHN McQUAKER,
Town Engineer. Chairman Waterworks Com.
22

Notice to Contractors

Tenders for

High School Building

Moosomin, Sask.

Sealed tenders addressed to the undersigned at Moosomin, Sask., and marked on envelope, "Tender for High School Building" will be received until 8 o'clock in the afternoon, central time, of the 7TH DAY OF JUNE, 1909, for the erection and construction of a High School Building, in the Town of Moosomin, Sask., in accordance with the plans and specifications prepared and approved by the Architect, which plans and specifications may be seen at the office of the Town Clerk, Town Hall, Moosomin.

The lowest or any tender not necessarily accepted.

THOS. MARSHALL, Secretary Treasurer,
Moosomin High School Board,
Moosomin, Sask. 21

Positions Wanted or Vacant

WANTED—STONECUTTER to cut bases. Apply stating wages to Box 767, CONTRACT RECORD, Toronto. 21

TINSMITH WANTED—For Prince Albert, Sask. None but a1 mechanic need apply; one capable of doing all kinds of general tinsmithing, shop work and jobbing; estimating and taking charge of shop; state experience and salary expected; references. Box 766, CONTRACT RECORD Toronto. 21

Building is brisk at Grand Forks, B. C., where the work is in progress of replacing business and residence structures destroyed by forest fires last summer.

Limestone

200 acres hard and building limestone, 82 miles from Toronto. 200 rods distant, on two road allowances, from Canadian Northern Ontario track. Deposit over fifty feet chick. Large dwelling house, barn, stables, and good well on property. Will sell whole or part. A rare opportunity to secure, at reasonable prices, unlimited supplies of first class limestone near railway with accommodation for men and teams. Box 772. CONTRACT RECORD, Toronto. 22

Tenders

for Concrete Sidewalk

in Town of North Toronto, County of York, on Gordon Street, Douglas Avenue and Glenwood Avenue, will be received by the undersigned, up to 7.30 o'clock p.m., on

MONDAY, 31ST MAY, 1909

See Plans and Specifications, etc., with undersigned, at Town Hall, Eglinton. Any tender not necessarily accepted.

W. J. DOUGLAS, Clerk,
Town North Toronto,
21 Eglinton, P.O.

New Companies

Kingston Pulp Company, Limited, Kingston, Ont., incorporated, capital $100,000. Incorporators, D. Smith, C. A. Macpherson, H. Macpherson and F. King, all of Kingston, Ont., and F. H. Hooper, of Brownsburg, Que.

Boyds Limited, Winnipeg, Man., incorporated as general contractors and engineers, capital $20,000. Incorporators, N. Boyd, W. J. Boyd, W. S. Boyd and C. A. Crawley, all of Winnipeg; and W. Barber, of Carberry, Man.

MacKinnon Holmes & Company, Limited, Sherbrooke, Que., incorporated as civil and mechanical engineers, capital $75,000. Incorporators, G. D. MacKinnon and J. Nicol, both of Sherbrooke, Que; A. R. Holmes and P. Mullen, Philadelphia, Pa., and others.

Western Power Company, Montreal, Que., incorporated, capital $5,000,000. Incorporators, J. W. Burrill, G. P. Wilson, L. R. Warden, H. G. Boyle and T. Hood, all of Montreal.

Eastern Canada Portland Cement Company, Quebec, Que., incorporated, capital $2,750,000. Incorporators, C. A. Irvin, P. H. Saver, S. R. Bell, all of Ottawa, Ont.; S. G. Near, of Toronto, Ont., and A. Richer, of Hull, Que.

Ogilvie Bros., Limited, Montreal, Que., incorporated as general contractors and to carry on the business of plumbing and heating, capital $45,000. Incorporators, P. C. and S. Ogilvie, G. Duff, H. Tucker and J. D. Cameron, all of Montreal, Que.

Desnoyers, Varin & Company, Limited, Montreal, Que., incorporated as lumber manufacturers, etc., capital $95,000. Incorporators, W. Reed, L'Assomption, Que.; T. Desnoyers, Maisonneuve, Que.; V. Varin, J. C. Lamothe, and others, of Montreal.

Brigden Rural Telephone Company, Limited, Brigden, Ont., incorporated, capital $40,000. Incorporators, B. Stephens, C. Capes, D. Brown, W. S. Tucker, A. Gray and A. Stephens, all of Moore Township, Ont.

Dunn Lumber Company, Limited, Waubaushene, Ont., incorporated, capital $15,000. Incorporators, W. J. Sheppard, F. M. Gray, both of Coldwater, Ont.; C. H. Sheppard and W. H. Russell, both of Waubaushene, and J. T. Dunn, of Toronto.

Sarnia-Nipissing Lumber Company, Sarnia, Ont., incorporated, capital $40,000. Incorporators, W. Logie, D. S. Burnett, C. H. Belton and M. Mackenzie, all of Sarnia, Ont., and A. J. Mackenzie, Toronto, Ont.

Komoka Building Company, Limited, Komoka, Ont., incorporated, capital $2,500. Incorporators, A. P. Smith, J. B. Janes, D. J. Mathewson, W. J. Hopkins and G. Luce, all of Lobo Township, Ont.

Saskatoon Piano Company, Limited, Guelph, Ont., incorporated, capital $50,000. Incorporators, J. Brown, A. M. Brown, D. Allan, W. M. Pentelow and R. Logan, all of Guelph, Ont.

Dunbar Lumber Company, Limited, Elk Lake, Ont., incorporated, capital, $40,000. Incorporators, J. A. McAndrew, G. H. Kilmer, H. H. Davis and N. R. Robertson, all of Toronto.

Mozart Piano Company, Limited, Toronto, Ont., incorporated, capital $10,000. Incorporators, H. C. Heidman, C. L. Carruthers, G. T. Domelle and others, all of Toronto, Ont.

To Make Concrete Watertight

Great care should be exercised in handling concrete. While the materials employed may be perfectly graded and the proper proportions of cement and of hydrated lime used, yet if poorly mixed with water, or improperly placed, or if points are left in the mass, the wall is likely to leak. In the first place, says "Cement Age," the mixture must be thorough, and in the second place, sufficient water must be employed to give at least a mushy mix, so that it will settle into place with only a small amount of ramming.

Fully as important as the mixture is the bonding of the concrete between two days' work. For a small structure which must be watertight, it is advisable to place the concrete continuously, allowing no joint whatever, and not even permitting the concrete to stiffen up between the batches. Even an interruption of an hour in the middle of a hot day has been known to form a joint which will allow water to pass. If continuous work is impracticable, the old surface of the concrete must be thoroughly cleaned of all dirt and partially set cement, so as to expose the concrete.

It is recommended that a layer of soft cement paste or else 1:1 mortar be spread upon the old concrete after thoroughly soaking it. Lay the new concrete before the mortar shows signs of stiffening. Avoid the formation of joints through which water will pass. Such an accident should be guarded against by cleaning surfaces, for whenever partially set cement is left on old concrete trouble invariably occurs.

Supplementary letters patent have been issued changing the corporate name of the Fleming Grate Bar Company, Limited, to that of the Butterworth Foundry, Limited, granting the company further powers and increasing the capital from $40,000 to $89,000.

The weights of pile-driver hammers most favored by railroad engineers representing 37 roads and by 14 other engineers and contractors are 2,500 and 3,000 pounds, as shown by data in the report of the committee on wooden bridges and trestles of the American Railway Engineering and Maintenance of Way Association. This refers to pile drivers for use on water, land and on railroad cars. Out of 57 replies to the question as to type of hammer, 43 preferred drop hammers, 9 preferred steam hammers, and the others used both.

Practical and Impractical Window Construction

By G. J. Shuster.

In figs. 1 and 2 in the accompanying illustration there is shown a sound and substantial method of constructing sills in window frames for studded buildings. It will be noticed by referring to fig. 2 that no sub sill is used. This, in the opinion of the writer, is not necessary where no shutters are used, as nowadays screens and storm windows are made in one piece and reach across window frame, hence it is not necessary to have a sub sill for them to shut against as in case of shutters or blinds. One objection to the sub sill is when 2 by 4 or 2 by 6 are used for window sill, and while the sub sill is usually gained into the jambs ¼-inch to 5-16ths of an inch, the window sill is then dropped in between jambs and no gains cut in jamb to receive and support it. When casings are fit snugly to sill they have a tendency to push it away from the sub sill, and the sub sill being only ⅞ of an inch thick, usually will cut and turn up and separate from the sill and leave a bad joint where wind and rain will get through, whereas if sill was made of 2 by 8 no such defect would occur.

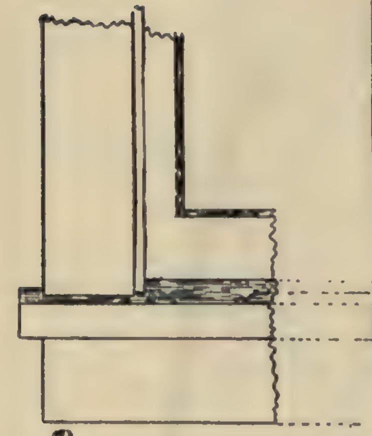
FIG. 1

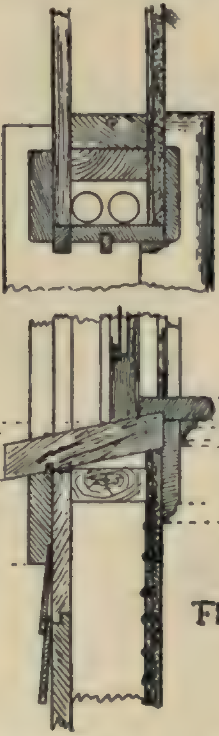
FIG. 2

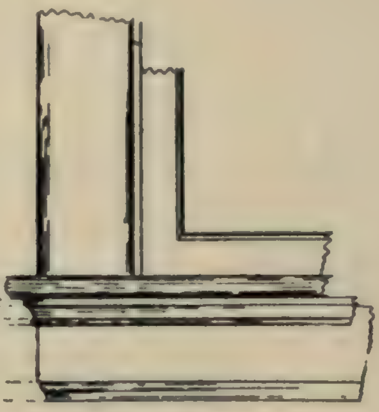
FIG. 3.

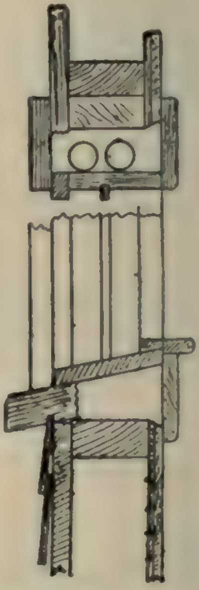
FIG. 4

Another objection against the sub sill is that where the window stool fits down on the sub sill, it cannot be lightly nailed to it, as the sub sill is only ⅞ of an inch thick. It does not afford solid nailing, as is the case where 2 by 8 sill is used, and the window stool will not remain tight to it, thereby leaving a place where water will some time get through during a rain storm. Still another objection is that when a sub sill is used and the window sill is 2 by 4 or 2 by 6 this will leave an open space between the top of header and sub sill 3 inches or 4 inches, and usually the carpenter neglects to fill this in so that the lather can lath it. Consequently the result is an impractical job, as shown at fig. 4, which leaves a place for the cold wind to get in, which is a very poor job and should be discouraged, as the plastering should fit up tightly against the frame all the way round on all exterior openings. Where a good job is desired it is best to construct the frame with an apron piece, as shown in fig. 2; this should be connected to sill with a tongue and grooved joint and lower edge rabbeted to receive the siding. The reason for using an apron piece is that when same is tightly fitted up against sill and properly nailed to it and to studding, it will act as a firm support to sill and keep it up tight against casing and prevent the sill from caving in the centre, as it often does where no apron piece is used.

A glance at fig. 4 where no apron piece is used will show that the sill has practically no support under casing and quite often, as before stated, when casings are fitted down tight to sill they have a tendency to push it away from the sub sill, especially when aided by the workmen, who occasionally stand on the outer edge of the sill while constructing the building.

In connection with the above, I wish to say that if sills are constructed as at fig. 2 and the work properly done, no such defects will occur as pointed out in fig. 4, but sills will remain straight and stay up tight against the end of the casings, which is not often the case where no apron piece is used. It is also a poor practice to cut off the jamb flush with bottom of sill before setting frame, as by so doing most of the strength gained by housing the sill to jamb is lost. The jamb should be left ⅜ of an inch or ½ inch below bottom of sill, and this amount should be removed from header.

Previous to papering, a rough-finished wall may be given a coat of good glue size, using half paste with it, and thickening the size with ochre or whiting. This mixture fills up the rough places pretty well, and when the coat is dry it may be gone over with coarse sandpaper to partly smooth the surface. The same mixture makes a good coating for rough, weather-beaten outside work.

Gloss in whitewashed ceilings should be avoided. The effect can be obtained by using an excess of size, but the wash so prepared is very liable to crack and peel off.

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Vol. 23 Toronto, May 26, 1909 No. 21

A Word to Builders Anent Defective Scaffolding

There is no truer aphorism than "Familiarity breeds contempt." At the present rate of progress, it will not be very long before many people will consider that a few casualties are necessary evils in the erection of any structure larger than a summer cottage. The subject of defective scaffolding is an old one, but this is an argument in favor of its discussion. To the contractor it is a matter of the greatest import. Often, in the case of accident, it is he who is the greatest sufferer; for while he may be ready to go to the limit of his resources—and sometimes this is not far enough—to settle an accident case amicably, there is an aftermath, often just the suggestion of a stigma, that is far from pleasant. Then there is the workman's standpoint. There have been so many cases of misrepresentation on the part of the workman, that the sympathy of the masters has been considerably lessened. When so many cases of wilful fraud can be so readily brought to mind, there is small wonder in this, but, even so, it is not fair to let the honest suffer with the dishonest. After all, what numbers of workmen there are whose principles are beyond question; and any way they have a right to be protected while pursuing their daily avocations. In a recent case argued in the Quebec courts (see legal department of this issue), it was held that "where men are placed in the charge of a foreman, especially where they are sent into a position of danger, it is the duty of the foreman in charge to examine the precautions which have been taken to make the work safe." Here, then, is another aspect of the matter. Careful inspection of scaffolding is not only called for in the workman's interests and those of the contractor, but it is demanded by law. Contractors have entered upon what will probably be a record season of building activity, but not even in the height of the pressure will there be any excuse for their neglecting the proper precautions. A man who takes risks with his scaffolding must put up with the consequences. He has had plenty of chance to find out what he will get up against in litigation with a workman, and if he has not benefited by the opportunity, he alone is to blame. From a selfish standpoint, from humanitarian considerations, from a legal aspect and from all the dictates of common sense, builders should see to it that in the erection of scaffolding no stone is left unturned for the adequate protection of the workman.

Architects Should Have Practical Training

It is contended by not a few who are best able to express an opinion on the subject, that if the rising generation of architects will study to combine with the practice of architecture a more practical acquaintance with the various branches of the building industry, and endeavor to familiarize themselves more closely with the general principles of the construction which they are called upon to supervise, the result will be the construction of much better buildings than are now being erected. At a recent professional gathering, a prominent architect made the following remarks:

"Architects should be practical builders, and should have an exact and thorough knowledge of building. How is an architect to supervise the construction of a building he has designed, with any justice to himself or the owner, if he is not thoroughly informed in regard to building? There are many so-called architects who are merely draughtsmen, who can make a pretty picture, but who have not the practical knowledge of the building trade which makes them sure of themselves when it comes to erecting the building they have designed on paper. In my opinion, all architects should have practical training as builders, either before they take the course in the architectural schools, or after they have finished that course. If the law required the architect to be a practical builder, as well as a draughtsman, there would be no falling down of buildings.'

Too often the architect's supervision is such only in name. It cannot be what it should be unless the architect is practically schooled in the principles upon which the building trade is founded. In many branches of engineering, it is essential for the young engineer at the outset to learn the practical end from the ground up. If this is a sine qua non in the training of the engineer, how can the architect afford to sacrifice everything to theory? It is not enough for an architect to be able to get out a set of plans. He should be able to certify, of his own personal, practical knowledge, that the building in its several constructional features, satisfies the most rigid requirements of modern science.

Competition for Architectural Students

Designs for a Moderate Cost House

Architectural students are reminded of the competition inaugurated by this journal for designs for a $2,500 suburban or town residence. The drawings are to be sent to the Editor not later than June 31 next, and are to be signed by a "nom de plume" and accompanied by an envelope containing the student's name, address and nom-de-plume, on one sheet of paper. For the benefit of any who may not have seen the original announcement, the details are appended:

The competition will be open to all Canadian students in architecture.

Three prizes of $20, $15 and $10 will be given.

The following members of the Ontario Association of Architects will act as judges: Messrs. H. B. Gordon, of Gordon & Helliwell, Toronto; James Gemmell, of Smith & Gemmell, Toronto, and H. Sproatt, of Sproatt & Rolph, Toronto.

Designs are to be for a suburban, town or small city residence, to cost $2,500, on a permanent foundation, the lot to be 50 x 150 feet. A house with an extended front will be preferred rather than a deep one. The building is to be kept back from the roadway 50 feet, and path, grass or garden are to be shown in front and vegetable garden, shrubs or fruit trees plotted out.

The accommodation is to be as follows:

First floor:—
Living room ....12 x 18 square feet.
Study .... 8 x 12 square feet.
Kitchen ....12 x 10 square feet.
Entrance hall, stairs, vestibule and coat room, pantry and verandah.

Second floor:—
Bathroom and three bedrooms.

The materials of construction are to be concrete for the cellar, and wood boarded frame, finished with shingles, clapboard or plaster.

The designs are to be drawn to scale of ⅛-inch and to include three plans and two elevations, also perspective if desired, but not obligatory.

Drawings are to be in black ink only, on white paper —walls blacked in. Elevations may be shaded in brush or pen work.

The decision of the judges will be published as soon as possible after the close of the competition.

The drawings are to be the property of the "Contract Record," which is to be at liberty to reproduce those which it desires to publish.

Discussion on Concrete Columns

A discussion on "Concrete Columns" was the feature of the programme at the Engineers' Club on Thursday, May 16th. In introducing the subject, Mr. Peter Gillespie referred to the two recognized methods by which concrete columns are reinforced, viz., by longitudinal rods and by hoops or spirals. The efficiency of the first method depends upon the fact that the two materials deform together and that, therefore, they are stressed in proportion to their relative rigidities.

Tests from the Watertown Arsenal and elsewhere were cited to show that in the reinforced column as ordinarily constructed and loaded, the compressive stress in the steel accompanying a stress in the concrete of 50 pounds per square inch, is approximately 5,000 pounds per square inch. When it is remembered that modern practice endorses stresses in steel very much greater than this we are compelled to conclude that the steel in such a column is not economically employed. Wherein lies the remedy? The solution, the speaker stated, is to come through the employment of richer mixtures. A one-to-one matured concrete, it was said, has a crushing strength of 5,000 pounds per square inch and over and takes for equal deformations, a stress one-tenth that of steel. If for such a concrete a working stress of 1,250 pounds per square inch be assumed, it follows that the imbedded metal will be stressed to the extent of 12,500 pounds per square inch—a condition very much more satisfactory than that previously referred to. The safe load on a 12 x 12-inch column, say 10 feet high, constructed of such a concrete and with four imbedded steel rods, each a square inch in section, will be 112½ tons and the entire cost, including materials, labor and forms, will be $1.48 per foot of height.

It was then pointed out that a steel column capable of carrying an equivalent load will weigh perhaps 65 pounds per foot of height, will cost $3.25 per lineal foot and without fireproofing of any kind, will occupy an area nearly as great as that of the concrete column. In comparison with this, a reinforced concrete column of the dimensions previously given, containing the same quantity of steel but of the ordinary 1:2:4 mix, will cost $1.30 per foot of height and will have a safe load of 54 tons. That is, a saving of 12 per cent. in the cost is secured at a sacrifice of 52 per cent. of the carrying capacity.

The hooped column depends for its efficiency on the fact that when a prism of a material such as concrete is loaded axially, and in consequence shortened by the stress, it wil suffer lateral swellings or extensions. The magnitude of these lateral extensions, experiment shows, is about 1-10 that of the axial deformation. If hoops are provided, they will restrain the concrete, preventing, to some extent, this lateral swelling.. A permissible strain in steel structures is 1-20 of 1 per cent. If a concrete column be subjected to such a strain axially, by the rule just stated, its lateral extension will be 1-200 of 1 per cent. A hoop, if it assumes the same deformation as the concrete would assume if unrestrained, would therefore be stressed to only 1,500 pounds per square inch. As a matter of fact, it was pointed out, its strain will be considerably less than this, otherwise its usefulness will be nil. This will indicate that for moderate loads on the column, the steel is stressed to a very small extent. Experiments also show that in order to stress the steel in the hoops up to or approaching the elastic limit, relative shortenings of the column perhaps 50 times that which we would think of tolerating in a steel column, are necessary. From the character of the deformations, it is manifest too, that it is quite impossible to secure simultaneously, the efficient working of the steel in longitudinals and hoops when both are employed in the same reinforced concrete column.

The conclusions to which the speaker invited the consideration of those present were that a rich mix is an economical method of securing strength and the efficient employment of longitudinals in a reinforced concrete column; that for equal loads, such a reinforced concrete column is much cheaper than steel; that for moderate stresses in the concrete, hoops are probably stressed very low indeed, and that it is apparently impossible for both longitudinals and hoops to operate efficiently in the same column.

In the discussion that followed, Messrs. Canniff, Gagnè, Kahn, Somerville and others contributed some interesting observations.

Personal Mention

Mr. H. D. McMordie, B.A.Sc., Toronto, has obtained an appointment on the staff of Mr. Willis Chipman.

Professor E. A. Stone, Dean of the Engineering School of the University of New Brunswick, will leave shortly on a three months' trip to Europe.

Messrs. J. A. U. Beaudry and G. H. Gagnat, civil engineers and patent solicitors, Montreal, have removed from 3 Place d'Armes Hill to 52 St. James St.

Mr. W. B. Redfern, B.A.Sc., who recently graduated from the University of Toronto, has joined the staff of Mr. Willis Chipman, consulting engineer, Toronto.

Mr. D. M. McCargar, recently electrical engineer for the Belleville Portland Cement Company, Belleville, Ont., has jointed the Toronto staff of Allis-Chalmers-Bullock, Limited.

Sir Robert Perks, Bart., of MacArthur, Perks & Company, Limited, contractors, Ottawa, Ont., recently paid a visit to Toronto on business connected with the proposed Georgian Bay Canal.

The Impressions of a Settler

To the Editor of the "Contract Record":—

Having been engaged in the building line in the old country for a great many years prior to taking up my residence in Canada, I am greatly surprised at what I may call the rough and ready method of frame building for flats and dwellings. It certainly does not seem to me to be a very lasting construction. It is the custom and as such it passes, but is the time not approaching when the builders of the country should build more substantially? I have been still more astonished at the method employed in the erection of large skating rinks, etc., buildings which must have cost a great deal, not only to erect but to keep in repair. In the erection of such buildings, in foundries and in large workshops, Canada appears to me to have been behind the times. There are roofs in various parts of Great Britain which have been constructed forty and fifty years and which are quite as good now as ever. These roofs are from 25 to 100 feet span and are made of lumber. They are perfectly safe at all times and repairs or snow clearing can be carried out with the greatest facility. I know of acres of works, shipyards, foundries, etc., that are covered in this way—the premises of Harland & Wolff for instance—and the system is so easily adaptable and can be put into practice at such a moderate cost that I am greatly surprised that it has not been adopted long since in this country. A SETTLER.

Fashion in Architecture

"One effect of planning our houses after the thought of other people," says the "Craftsman" for April, "rather than our own, is seen in the constant changing and remodelling of our houses." It is no exaggeration to say that a house built five years ago, according to the prevailing fashion at that time, is considered by many people to be out-of-date this year and not quite up to the mark, unless it can be remodelled so as to supply the latest improvements or the newest style of decoration. It is amazing to see how many people who are otherwise honest and direct are apparently content to live in houses that express anything rather than these qualities—houses that need remodelling every little while because the original thought in them was on a false basis, and therefore unsatisfying—and seem never to realize the cause of their unrest.

The reason for this, the "Craftsman" asserts, is that most people regard art as something in the nature of a hidden mystery, requiring long training and special aptitude even to comprehend it, and as something to be left in the hands of experts whose productions are taken on trust as being necessarily the right thing. With such an idea prevailing, nothing but lack of permanency could result, for the reason that a ready-made house, planned by someone else after the dictates of what is in vogue at the time of the building, has in it no trace of the owner's individuality and only indirectly meets his needs.

Depositing Concrete from a Height

A correspondent of "The Engineering Record," writing on the above subject, makes the following statements:

Not long ago I worked on a job where the concrete was dropped 35 feet. No pipe was used. The material was delivered in buckets by derricks and simply dumped into place from the top of the forms. By examining the completed work it was not possible to tell which concrete had been dropped 35 feet and which 5 feet. I am now employed on a job where the specifications state that no concrete shall be dropped more than 3 feet. As the work progressed it became evident that we could not comply with that clause. Accordingly, the distance was increased until now we are dropping concrete 28 feet and the engineer is well pleased with the results.

I wish to call your attention to a reinforced concrete water tank built at Little Falls, N.J., by Mr. W. B. Fuller. This structure is 43 feet high and 10 feet inside diameter. The walls are 15 inches thick at the bottom and 10 inches thick at the top. The tank was built in eight hours and is a perfect monolith, all concrete being dropped from the top, or 43 feet at the beginning. The concrete was mixed very wet, the mixture being one part cement, three parts sand and seven parts broken stone. No plastering or waterproofing of any kind was used, but the tank was found to be absolutely watertight.

The cement man should not think that millstones have quite disappeared. There are still a few left, but there won't be much longer. Do not think millstones will come into fashion again. Try a cube mill.

Denver, Col., is the latest large American city to adopt reinforced concrete pipe for sewers. The city has investigated the sewer pipe question and has decided that it can save money by using the concrete product.

Municipal Engineering and Construction
Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

Ozone Water Purification Plant at Lindsay, Ont.

The ozone-purification plant, installed by the town of Lindsay, Ont., for the treatment of its entire water supply, is attracting the attention of engineers and municipal officials by reason of its amazingly low cost, both of installation and operation. Taking the swampy water of the Scugog river, it removes all disagreeable taste, color and smell, and destroys all pathogenic and intestinal bacteria, at a total cost of 44 cents per million gallons. Including a reinforced concrete rough filter, it cost the town $7,250 to build. It runs with no attention other than the turning on of an electric switch, and the regular attendants of the pump house have learned to take it apart and reconstruct it without any expert supervision.

Plant under Construction.

The water flows entirely by gravity through the apparatus to the suction well of the high-pressure pumps serving the town. Flowing from the river, it first passes through a rapid filter consisting of about two feet of coarse sand. This filter is cleaned every other day by reversing the current, taking pressure from the town main at 60 to 80 pounds. After passing through the filter, the water flows down a series of pipes to the bottom of a deep well, six feet square. In doing so it entrains the ozonized air, and carries it to the bottom of the well, which is supplied with baffle plates to prolong the mixture of air and water. The exhausted ozone escapes with the air at the top of the well, and the water then flows into the suction chamber. Up to this point the plant is all underground.

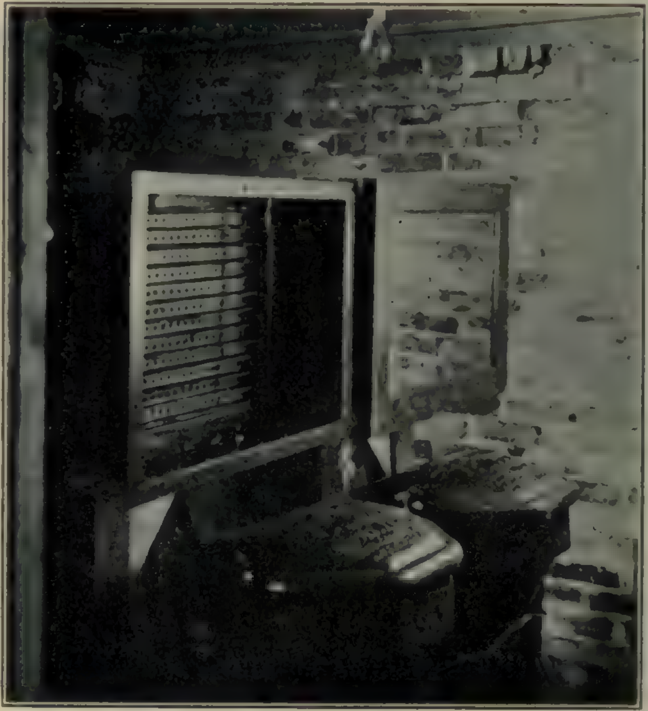
In a small brick lean-to (8 x 10 feet) built against the pump house, are two ozonizers, each with its separate transformer and air supply. They can be run separately or together. They consist of aluminum plates alternating with sheets of micanite. The air is passed into them by a Buffalo blower of $\frac{1}{8}$ h.p. Each ozonizer consumes $2\frac{1}{2}$ k.w. of electrical energy, which the town buys from the local company at the rate of $35 per h.p. per year.

The plant has been running continuously since last October. Bacterial tests show the complete elimination of all pathogenic and intestinal germs, and only a few of the harmless water bacteria are left in the ozonized water. Dissolved organic matter is largely reduced, and, as might be expected, the treated water is very rich in dissolved oxygen, which gives it its sparkling appearance and palatable taste.

Soon after the plant was put in operation the engineer and chemist of the Baltimore County Water & Electric Company visited it, and although this company operates both slow sand and mechanical filters (for the supply of the suburbs of Baltimore), the directors, on the reports of their engineer and chemist, decided to build an ozonizing plant on the Howard-Bridge system, to treat from five to eight million gallons a day. The guaranteed cost of operating the Baltimore plant is one dollar per million gallons.

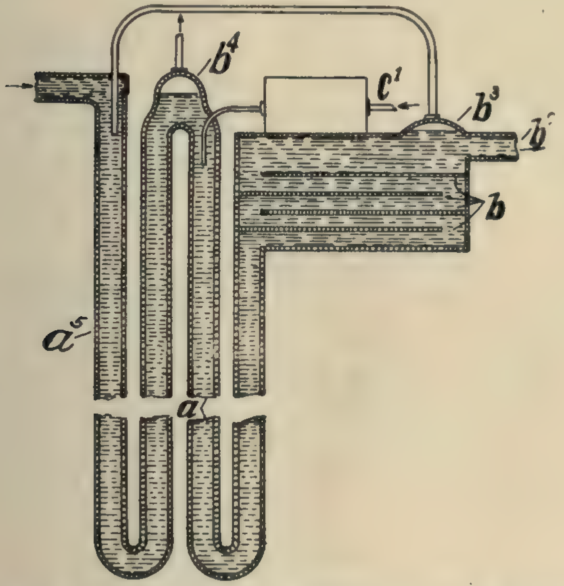
The following interesting details concerning this plant are furnished by "Applied Science":

The Lindsay plant consists of a raw water basin Hungerford sand filter, Asperator sterilizer, ozonizer and pure water basin. The filtered water basin of the old plant is utilized, the water passing from these through on 8-inch pipe into the surface of the sand in the Hungerford filter, losing about two inches of head in so doing. This rough mechanical filter is intended to strain out the suspended matter. The suspended matter is excluded for two reasons, first a question of color, as suspended particles always give water a muddy color which can only be removed by a filter, as ozone has little or no action on suspended matter other than organic matter and bacteria; second, a saving of ozone, as organic matter may to some extent be removed by a filter, and therefore the ozone will only have to act on the bacteria and the dissolved organic matter that passes through the filter.


View of Ozonizers.

The rough filter consists of a rectangular tank of reinforced concrete 12 by 15 feet deep sunk in the ground. It contains a series of pipes which gradually enlarge as they join each other, finally terminating in an 8-inch discharge pipe. Sunk in the upper sides of these pipes are 130 brass sand valves, which allow the water to pass in either direction but exclude the sand. On these valves there is about three feet of sharp hard sand which accomplishes the removal of the grosser particles of suspended matter. The filter is cleaned by means of a valve so arranged that water from the city mains at a pressure of 60 to 90 pounds can be passed upward through the valves and sand. The wash water escapes through two valves into the river. This process of washing takes about three minutes and is done every second or third day, depending on the condition of the river.

In flowing through the Hungerford filter the loss in head at 500 gallons a minute is 4 feet 8 inches. It was designed to work at 1,000 gallons a minute, but the level of the river during this very dry season has fallen lower than ever before and there is not at present sufficient head to give this large volume of water. Under ordinary circumstances 500 gallons per minute is the pumping rate. This rate, however, is doubled during fires; an auxiliary filter of the same type may be installed to give 1,000 gallons a minute at any level of the river.



Raw water enters the pipe a_5 drawing, by suction, unobsorbed ozone from b_1 The waste gases escape at b_4. The current of water in a sucks fresh ozone into itself from the ozonizer c; and after passing around the baffle plates in b, the purified water escapes at b_2.

From the rough filter the water passes into another chamber in which its height is regulated by a butterfly valve and float. Here it flows into an air-tight box of concrete connected to the ozonizer by a 2-inch pipe. The water now falls through a number of four-inch pipes, leading to the bottom of a well 30 feet deep, passing in so doing the ends of a great number of small pipes (see diagram for theory). The water by suction thus draws the ozonized air into it; and here is one of the special features of the plant. Other ozonizing plants have used an air compressor to force the ozonized air into the water; and as the compressor has to be worked without lubricants which would otherwise be oxidized by the ozone, such a compressor is a very costly and unsatisfactory machine.

The water and ozonized air now pass slowly upward through a system of baffle plates (see diagram) which prevent the ozonized air from too rapidly leaving the water. The head required to operate this sterilizer when treating 1,075 gallons of water a minute is only 20 inches. If the cost of power, and consequently of ozone, is high, the partially used ozone after passing from the water, may be collected and used over again. (See diagram.)

The electrical equipment is housed in a small brick "lean-to," 8 by 10 feet, built against the power house. In this building are two 2½ k.w. 60 cycle transformers, transforming from 1,040 volts, the town distribution voltage, to 8,000, 10,000 or 12,000 volts, depending on the leads used; a ⅛ h.p. motor driving a small blower to supply air to the ozonizers; and the two ozonizers. It will be noticed that there is no drying apparatus such as is used in European practice, Mr. Bridge having found that the yield of ozone is not increased enough by this to make up for the cost of operating either a refrigerating machine or a mechanical dryer.

The ozonizers (see photo), of which there are two, are quite distinct, in fact each ozonizer, with its own transformer and separate air inlet and outlet, is a separate unit, so that either or both may be operated. Each ozonizer contains 26 electrodes, 13 negative and 13 positive, each protected by its iron fuse. The electrodes are plates of aluminum 20 by 34 inches, and are filled with holes similar to those in a nutmeg grater. By an arrangement of baffles, the insulation being micanite plates and fibre, each litle discharge, of which there are five million, encloses a jet of air; and here is one of the fine points of the ozonizers. It is a well known fact that an electrical discharge repels air, and if it were not for the arrangement in the ozonizers the air blown on the discharge would be repelled by it, and not nearly as large a percentage of ozone generated.

The plant as it is at present operated is supplying 4,000,000 to 4,500,000 gallons of water a day. Five hundred gallons a minute are pumped and about 4 h.p. of electricity is regularly used in the ozonizer. This may be increased to 8 h.p. as specified in the contract. The plant is costing the town $7,250; but this cost is low on account of using old filters and excavations. To duplicate it would cost in the neighborhood of $25,000.

The plant to date is eminently satisfactory. The water after filtration is clear, cold, odorless, and, in fact, looks and tastes like good spring water.

There is so much good clay in this country, and so many thoroughly reliable brick manufacturers, that there is really no excuse for the production of bad bricks, or for their use, says "Carpentry and Building"; bnt any brick is not necessarily a good brick, and as much care and intelligent discretion must be used in the employment of this material as in connection with any building medium. There is a prevailing conception among builders that granite is one of the most enduring of stones, but, as a matter of fact, most granite would be outlived by a thoroughly first quality of hard-burned brick. A pure syenite, free from iron or mica, constitutes the most enduring of granite. A granite quarry may have good stone in some portions of the deposit and may be worthless in other portions. As a general rule, it is not safe to use granite for building unless the architect knows fully its composition and the part of the quarry from which it was taken. Sandstone is really a bad building material. The cementing material in sandstone has a very slight value, and it is probably the poorest material extensively used by builders, so far as resisting the action of frost is concerned, while the presence of iron constitutes an almost fatal defect.

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

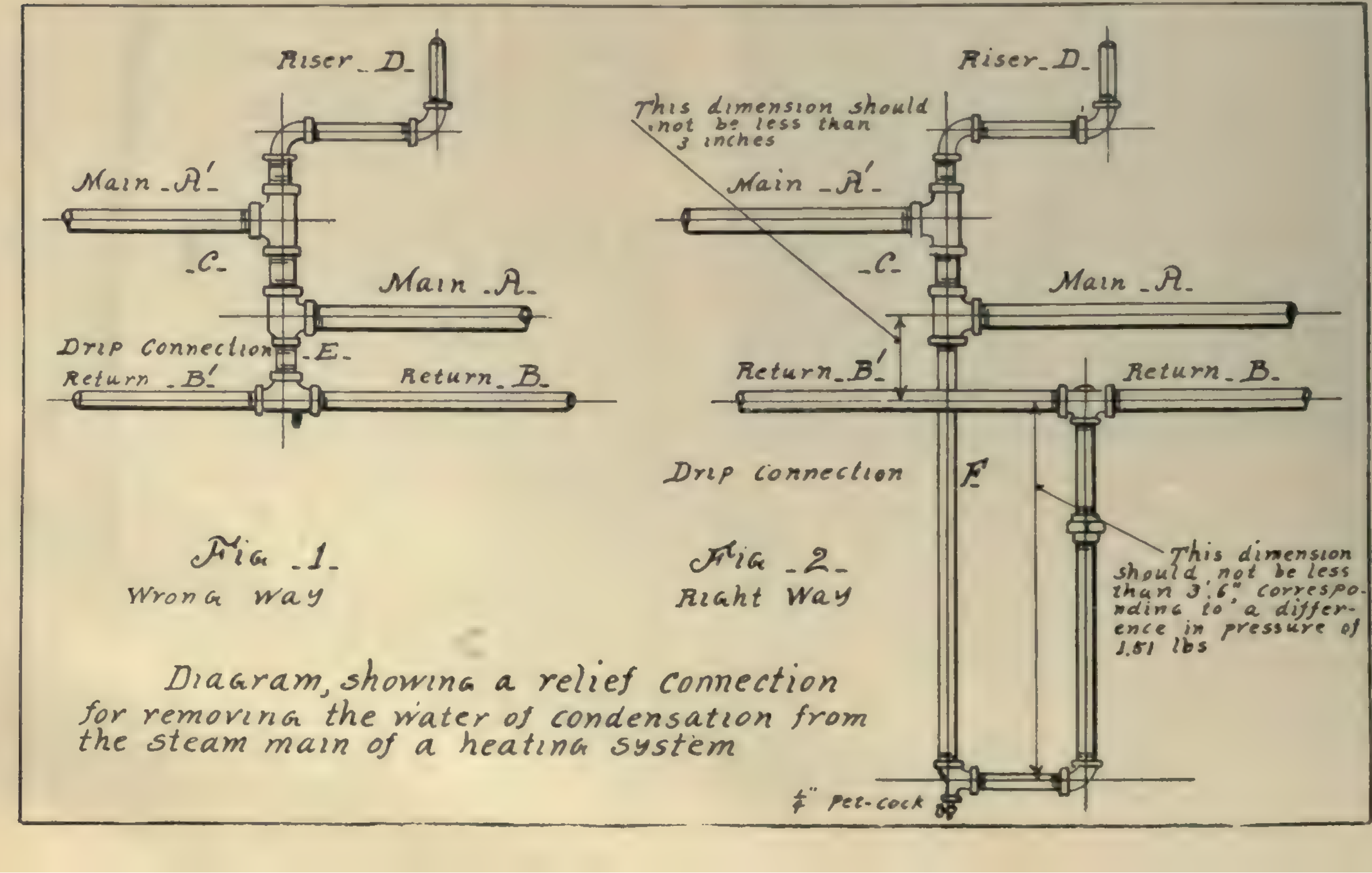
[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Water Hammer in a Steam Heating System

The design of a sytsem of piping to carry the steam to the radiators and return the water of condensation to the boiler without the noise so frequently heard, in steam heated buildings, is an easy matter for a practical heating engineer to accomplish, but is quite difficult for the ordinary steamfitter, or the man with a mere theoretical knowledge, says J. P. Lisk, M.E., in a recent number of the "Engineering Review." I am not obliged to prove this statement by argument, as there are numerous installations that will speak for themselves, when fired up.

Sketch No. 1 shows a wrong method of relieving a steam main of its water of condensation, yet in practice I have met with such arrangements of piping so often that I am led to believe it is a very common fault throughout the entire field of steam heating work. Referring to Fig. 1, A is a horizontal main supply pipe, C is a vertical riser supplying steam to a higher level through outlet D. After rising as high as the floor beams will allow, the main A′ is continued on to other parts of the building. The main return pipe B and B′, taking the water of condensation back to a pump receiver or to the boiler direct, have a connection, E, to the bottom of the steam main, which is intended to remove the water of condensation from this low point (the low point is made necessary by pitching the main in the direction in which the steam flows to the radiating surfaces) and returning it through the main return pipe to the receiver. or boiler, as the case may be. Right here is where the trouble begins if this connection is not properly made, and if, as I said in the beginning, it is made according to Fig. 1 it will not work satisfactorily. The system will pound and hammer, the radiator fill up with water which will rush back flooding the receiver, causing the pump to race, and quite frequently doing itself serious damage. The reason for this action is explained as follows: A heating system is a condenser of steam. The supply pipes carry the steam to the condensing surfaces. The return pipes carry the water of condensation back to the boiler. There is a varying difference of pressure between the steam and return pipes. This difference is greatest at the points where the steam first enters the system, and where the water finally leaves it. That is at the reducing valve and the receiver of the pump, or at the outlet of the boiler, and in the return pipe near the boiler.

To be better understood, I will explain, for the benefit of those not entirely familiar with heating work, that the water in the return pipe of a gravity system of heating is from twelve inches to three feet higher than the water level in the boiler. This condition is brought about by the difference in pressure, caused by the steam being condensed as it gives up its heat through the radiating surfaces, thereby occupying less space in the



Diagram, showing a relief connection for removing the water of condensation from the steam main of a heating system

system, consequently less pressure. This difference is greatest at the two extremes of the system, as mentioned above. Now, it will be easy to understand the trouble brought about in making a drip connection as shown by Fig. 1.

The steam entering the main through the reducing valve, or from the boiler direct, flows out until it reaches the point of relief, where it crosses over into the return pipe and feeds both ways. The water of condensation coming back through the return pipe meets an ever-increasing retardent in the steam flowing in the opposite direction, and as the volume of water increases the area of the steam space in the pipe decreases. The velocity of the steam increases in proportion to the contracted area through which it flows, eventually stopping the return water from flowing toward the boiler. The return water now fills the pipe, cutting off the supply of steam from the return pipe side. The steam beyond this immediately condenses forming a vacuum. The water now begins to flow, with high velocity, assisted by the pressure of steam back of it, until it meets with some obstruction, such as water from the radiating surfaces forced on by the steam from the feed main or an elbow where the pipe changes direction, producing the shock called water hammer. This shock is frequently great enough to rupture the pipe and do a great deal of damage to the building. Having pointed out a very common defect in the arrangement of a piping system for steam heating, and showing the results obtained as well as giving the reason for such results, let us see how the trouble may be avoided. Looking at Fig. 2 in the diagram, we see at once how this is accomplished. Instead of making connection, E, directly into the return pipe, B, the loop, F, is carried about 3 feet 6 inches below the level of the return pipe, as shown. This effectually prevents the steam from short circuiting into the return pipe. At the same time it allows the water of condensation to pass freely from the steam main A, and riser D, into the return pipe B, through which it passes to the receiver, or boiler.

The loop, while acting as a seal, also adjusts itself to the varying inequalities of pressure in the system, due to rapid change in working conditions. I have frequently seen the temperature of a building drop 20 degrees, during extremely cold weather, within a period of fifteen minutes. Such a large variation in condition naturally subjects the heating apparatus to greater duty, which means more heat units transmitted per square foot of surface, consequently more steam from the boiler and more water going back through the return pipes and a greater difference in pressure between the two extremes of the system. If a system is properly designed, it will adjust itself to wide variation in working conditions, but if errors of construction exist, as shown by Fig. 1, and some others to be shown and discussed later, there will certainly be more noise than is agreeable. There is also the probability of having to make repairs to a leaky system.

Summed up, the cause of water hammer consists in the fact that certain parts of the system, after being filled with steam, become isolated from their source of supply by the water that is free to move in the system, until the steam in the isolated parts is condensed, leaving a vacuum, into which the water rushes until it meets with some obstruction that interrupts its movement. The intensity of the blow delivered depends on many varying conditions. It ranges, however, all the way from a light shock, to a blow that ruptures pipe and fittings.

The line of least resistance lies in the rut.

The Evils of Cheap Plumbing

In the building of a home one of the chief demands on the owner is to see to it that the plumbing arrangements are properly made and the plumbing work properly done. Every feature of the installation, such as the location of closets and lavatories, should be carefully planned with the one single idea of making sure that the premises are sanitary. If the builder is wise, he will see to it that the specifications call for high grade material. Cheap piping and plumbers' supplies invariably prove the most costly in the end. They necessitate an almost endless series of repairs and inconvenience to the housewife, which disables her for the efficient exercise of her duties to the home. Much complaint is made of the plumbing expenses, and the comic artists have made them the subject of their jibes for a long time, but the amount of the bills is not to be considered if the owner of a home honestly desires to equip his house with the best in the market in the matter of plumbing supplies. The best is the cheapest by all odds.

The features to be considered on the outside of the house are the roof work and the conductors leading from the roof and the waste pipes from closets, bathrooms and sinks. The ridges, hip-rafters, valley gutters and platform roofs are often laid with zinc or galvanized iron, but a more durable job can be made with lead. Care should be taken in making proper junctions at the overlaps of either zinc, iron or lead. On this depends the prevention of water finding its way into the roof and causing ultimate decay. The eve gutters and down pipes, made of cast-iron, should have the required clips at the joints and be properly secured and supported. It is preferable, for sanitary reasons, that all soil and waste pipes should be erected outside the walls of the building. Water closets may be so arranged that they will be next the back wall or either side walls of the house, and the branch soil pipes should be carried through the thickness of the wall and inserted into a "branch-horn," cast on the upright soil pipe, and jointed thoroughly with red lead and rope yarn.

Many homes are rendered practically untenantable by the bathroom being too close to bedrooms. The fittings of the bathroom, when exposed, should be of gun-metal or nickel-plated. If common iron piping is employed it should be painted. Piping above the flooring should not be covered, but left exposed, so that any leakage may be readily detected, and in its arrangement the law of gravitation should be carefully taken into consideration. This latter is not only important but absolutely necessary. The location of hot water tanks and their various piping connections calls for the most scientific handling, and unless they are installed in a practical manner satisfactory results cannot be obtained.—Shoppell's.

Tarring Metal Pipes

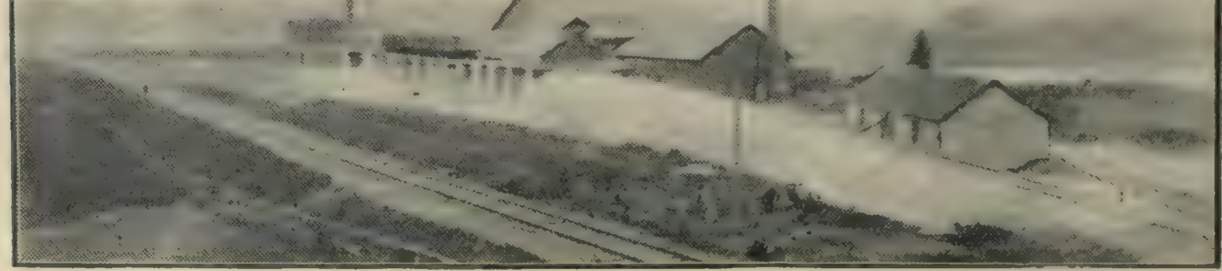
Two plans are in use for coating metallic pipes with a protecting surface of tar. In the one case the pipe is first heated and plunged into cold tar, and in the other, pipe, without preliminary heating, is slowly lowered into the hot tar. Under the former plan the metal has been dilated by heat and contracts in the tar bath. On being withdrawn the air bubbles can readily be brushed away, but the adhesion is not perfect. In the latter case the metal slowly expands and the tar adheres much more firmly. Moreover, if the pipes are heated before being tarred, there is a risk that they may become fissured, and the fissures, being filled with tar, would not be visible after the removal from the bath.

Slag Cement Plant at Sydney, N. S.

An interesting cement plant is that of the Sydney Cement Company, Limited, at Sydney, N.S. The plant is run in connection with the works of the Dominion Iron & Steel Company and is notable on account of its being the only slag cement plant in Canada.

Works of the Sydney Cement Company, Limited, at Sydney, N. S.

The cement works are situated at the junction of the Intercolonial and Sydney & Louisburg Railways, with the best of facilities for obtaining cheap fuel and raw materials and for the distribution of its products both by rail and sea. The slag is of a very high quality for the manufacture of cement. It contains 50 per cent. of lime and is very low in sulphur. Lime is obtained from Marble Mountain, on the Bras d'Or lakes. The raw material is run up on a steel concrete trestle and dumped. The lime goes to a hydrating house and after having been treated, is taken by conveyors and elevators to an elevated bin, from which it is measured out and automatically weighed in proper portion.



Sydney Cement Company's Works—Showing Railway Facilities.

The slag, after rough screening, is elevated to Ruggles-Coles dryers, from which it is carried to a fine screen, the fines going thence to a bin and the oversize to Allis-Chalmers rolls. After preliminary reduction and automatic weighing, the proper proportion of hydrated lime is added. The two ingredients are thoroughly mixed and passed to tube mills and there ground to a fineness of 8 per cent. residue on a 200-mesh sieve. This is the finished cement, ready for immediate use. The product is conveyed by the usual means to storage bins. Packing is done partly by hand and partly by the "Invincible Machine." The capacity of the plant is 500 barrels per day of 24 hours.

The raw materials, the materials in process of manufacture and the finished product are under the constant supervision of a chemist and assistants, who are provided with a well equipped chemical and physical laboratory. To this and to the very high quality of the raw materials may be attributed the success of the "Rampart" cement made at Sydney.

The special features of the product are a tendency to slowness in set, freedom from lime—and therefore soundness, freedom from surface crazing, and long continuance of increase in strength.

The cement has achieved an enviable reputation in the markets adjacent to the works and has been sent as far afield as Mexico and the West Indies.

LEGAL DEPARTMENT

Information for this Department is requested from Architects, Engineers, Contractors and Builders. Send in the particulars of recent cases in which you were interested, giving the main facts tersely.

Injury to Workman.—Pageau v. the Quebec, Montreal & Southern Railway Company was an action recently brought in the Superior Court of Quebec. The plaintiff, together with four other men, working under the supervision of one of the defendant's foremen, was engaged in shingling the roof of one of the defendant's country stations when the scaffolding, upon which the men were supported, gave way. The plaintiff fell to the ground and broke his ankle and sought to recover in the court $7,122.40 damages. Contributory negligence was pleaded and proved on both sides. The plaintiff admitted in the course of the evidence, that it was he and another who were charged with putting up the centre posts support of the scaffold, and that he doubted the sufficiency of the support. It was proved that the defendant's foreman did not examine the construction before he sent the men up to do their work. The court held that where men are placed in the charge of a foreman, especially where they are sent into a position of danger, it is the duty of the foreman in charge to examine the precautions which have been taken to make the work safe. In this instance, the defendant's foreman did not do so, and there could be certainly no question that those of the men who were not responsible for the insufficiency of the work would have been entitled to damages if they had been injured. The plaintiff was, to a certain extent, in fault. There was evidence that the scaffold should have been made of thicker boards than it was when it was meant that it should support the weight of five men in a space of less than 20 feet. It has been laid down in several cases that it is not enough for the employer, in matters where safety is concerned, to give an employee directions to do his work in a given manner, but he will be responsible if he does not personally see that his directions have been obeyed. In this instance, the work to be performed was comparatively simple, and probably did not require much instruction as to how it should be done. Indeed, no such instruction was given except that the work was to be well done, and the foreman did not look at the manner in which the work had been done before he sent the men up. The plaintiff was also negligent and the fault on either side was about equal. The plaintiff proved damages to the extent of $150 for doctors' bills, and $25 for hospital charges, and proved a considerable period of time during which he was unable to work. A doctor stated that he considered the plaintiff's ankle to be permanently reduced in strength to the extent of from 10 to 25 per cent. The judge concluded as follows: "My experience in these cases is that during the progress of a law suit the tendency on the plaintiff's part is to exaggerate the seriousness of the injury he has received, and that without any intention to deceive the court or to act dishonestly towards the defendant. In many cases which have come before me medical men have testified that after the conclusion of suits at law the progress of the injured persons towards recovery becomes much more rapid. I am, therefore, not disposed to think that the plaintiff will suffer injury to anything like the extent which he claims by his declaration. I find the damages the plaintiff has suffered amount to the sum of $1,200, and reducing that sum, in consequence of the contribution of the plaintiff to his own injuries, I fix the amount which he has a right to recover from the defendant at the sum of $600, for which I give judgment, with costs."

Expropriation of Land for Waterworks. The town of New Liskeard v. Fitzpatrick was an appeal by the corporation from an order of Judge Anglin increasing the sum of $1,50 awarded by a board of arbitrators upon expropriation proceedings by the town corporation, taken to acquire certain lands of J. W. Fitzpatrick, containing a spring of water, for waterworks purposes. Judge Anglin had increased this amount to $5,240, basing his calculations upon the income-producing value of the waters of the spring as a source of supply for the use of a waterworks system. The town objected to the principle by which this was arrived at, and to the calculation itself, as based upon insufficient and misleading data. The court gave effect to the first of these objections, holding it to be a clear and well established rule in such cases that the value to be arrived at is the value to the owner and not to the expropriating body. The case of Lucas v. Chesterfield Gas & Water Board was cited, where it was stated by the Court of Appeal that the basis to be taken must not be "a realized possibility," although it was held proper to regard the effect upon value of an unrealized possibility, such as that this spring would within a reasonable time probably be sought as a source of water supply by a neighboring town or village. And if more than one, then the circumstance, unimportant in this case, that there might be competition would also enter into the question. The evidence showed that the land itself, considered as agricultural land, its only apparent immediate use, was worth about $5 per acre. The only things of special value beyond that were the spring and the water front on Lake Temiskaming. For the whole 100 acres Mr. Fitzpatrick recently paid $2,700, a circumstance which the court held must have been overlooked by the arbitrators and which it was contended afforded the starting point for valuating. The town wanted to take the southern 50 acres, containing the spring ,and leave the remainder, valued at $5 per acre, to Mr. Fitzpatrick. Upon these considerations the appeal was allowed and the amount reduced to $2,500.

Use of Railway Property by Private Concern.—The Railway Commission has given judgment in an Ottawa case which, while based on an ordinary application, introduces a principle concerning the rights of a private company to seek to utilize the property of a railway corporation for its own purposes and those of a competing road. The case was that originated by the Export Lumber Company and for some time it has been on the list of the commission, argument being recently heard. The company wanted a piece of track built into its yard in order that the Canadian Pacific Railway might have access there, as well as the Grand Trunk. The line would have to cross the property of the latter corporation. The judgment refusing what was asked for was given by Assistant Chief Commissioner Scott, Judge Mabee and Commissioner McLean concurring. It sets forth that under the circumstances it would not be fair to allow the Grand Trunk property to be used as suggested, inasmuch as the gain would be purely for the applicant company and the C.P.R., and no public interest is at stake.

Pointers on Rough Testing

The things actually required for rough testing, says the "Building News," are exceedingly simple and few, consisting of water, a hammer, a saucepan, a bottle of sulphuric acid, and a knowledge of the defects to which building materials are liable.

Stones.

Stones ought always to be tested by tapping them over, either with a hard pebble or light hammer, in order to ascertain if they have any vents or sand-holes, whose presence is detected by a dull sound, which is unmistakable when it has once been heard in contrast with the metallic ring of a smart blow on sound stone. This applies to stones of almost all descriptions, though it may be noted that softly-compacted sandstones or oolitic limestones will sometimes emit a dull ring. This does not indicate local faults, but a general weak structure, and should always be taken as an indication that the stone in question should be viewed with suspicion. If it be placed in water, it will in all probability be found to absorb a large amount, owing to its loose and spongy character; it is probably liable to disintegration, and to the penetration of moisture. There are other easily-applied tests for stones, such as immersion of small, freshly-cut chippings in a glass of water, in which they should be left for half an hour, and then vigorously stirred, when, if they are loosely compacted or contain any appreciable amount of clayey substance, the water will turn muddy. It is not a test, however, which is often employed, and practical men are more inclined to rely upon a thorough inspection by tapping than anything else.

Slates.

In the case of slates, the immersion test is best replaced by standing them upright in a bucketful of water for about ten minutes, and then observing the state of the edge. If the slate be a soft one and unreliable, the water will be seen to have crept up along the layers of cleavage to any extent from one to three inches in that time, above the general level, and without showing on face; while if the slate is sound, there will be no appreciable rise. A bad slate, too, will, when wet, smell distinctly earthy, as if the clay of which it is composed had never really compacted into slate in nature's laboratory.

Bricks.

Bricks should be tested much in the same way as stone, it being possible to detect weak and faulty samples immediately by tapping them. The labor of tapping each one, however, is much too great for most people to indulge in, and it is possible to judge with tolerable accuracy the state of a whole batch by tapping a few; the testing of each one being only needed under a stringent specification, and in places where the very best work is required. Of course, badly cracked bricks can be detected by inspection, which is also the only means of discovering whether the color is uniform, and that which is required, and whether the arrises are properly sharp. Even soft hand-made rubber bricks will ring when struck if they have been properly made and burnt, and this is really the only test of their power to resist the atmosphere after the outer skin has been removed by rubbing or carving. The absorption test, although generally advocated in textbooks, is not always to be relied upon in the case of bricks, as the amount of water taken up varies greatly according to the class of brick which is used. A hard-pressed and machine-made brick, for instance, made from a heavy clay, absorbs very little, much less than even the most perfect rubber.

Mortar.

If there is any question as to the amount of sand contained in a particular sample of mortar, the only thing to do is to treat a little with acid; and this is a test which cannot be accomplished quite at a moment's notice. In the first place, a little mortar has to be carefully dried in a saucer over a fire or gas flame. It must then be weighed, the easiest way of doing this being to weigh it saucer and all, but with great accuracy. The next thing to do is to pour some sulphuric acid over it, when the lime will dissolve into the acid, except what escapes as carbonate acid gas. It does not do to try too much mortar at a time, as very marked effervescence takes place when the acid and the lime meet, and there is risk of a good deal being lost by overflowing the saucer. As soon as the effervescence subsides, the contents of the saucer should be carefully scraped out on to a filter of clean blotting paper, when the residue, after drying, can be reweighed and the saucer also weighed; it is then easy to find out what proportion by weight the sand bore to the lime. This does not correspond quite with the proportion by bulk, which is that by which mixing is done, and the difference must be borne in mind by approving or condemning any particular sample.

Sand.

Sand can generally be tested quite sufficiently, when in bulk, by rubbing a little between the fingers. It should feel sharp and gritty, and be rather coarse in texture, and leave no stain upon the hands. A soft-feeling sand of very fine grain does not make good mortar. It is always well, too, to just put the tongue to a small sample, in order to detect whether it contains any salt, in which case washing in running water is imperative; though preferably such sand should be rejected altogether.

Cement.

Cement, if it bears a good maker's guarantee, can almost always be relied upon, unless it has been exposed to the atmosphere during damp weather, when it may have become inert by air cooling. This is easily ascertained by plunging the hand into it, when it will strike cold. Anything made of a dead cement like this will be useless, as it possesses no more adhesion than so much sand. If a cement be suspected, on other grounds than this, there is one infallible test of its soundness, which takes about a day to apply, and is much more reliable than anything else short of submitting it to analytic and machine tensile tests, which occupy a long period. This is the boiling test. A small pat, about half an inch thick, is laid upon a piece of glass or slate to go in a saucepan. The pat may taper away to the edges, and is best made in the evening and left for the night to set. In the morning it can be boiled, and kept gently simmering for some six hours, further water being added from time to time as it evaporates. Long before this period of time has elapsed, however, the cement will have turned to soup unless it is a good sample. If it has slightly cooled, the pat may curl up at the edges and come away from the glass; but a thoroughly good sample will remain adherent to it, and be in as sound a state as when it was put into the saucepan.

Timber.

Timber can generally be accepted or rejected on inspection. Nothing also will show whether it contains more than a fair proportion of sapwood, or whether it is "doaty," or, in other words, subject to a disease like

(Continued on page 42)

Claimed Fraud in Use of Firm Name

One "Standard" Company Sues Another for Duplicating Trade Mark.

An important judgement was rendered this morning by Hon. Mr. Justice Archibald in a trade-mark and trade-name case. The Standard Sanitary Manufacturing Company had been doing business in the United States and Canada under the Trade-Name of "Standard" ever since the year 1890. In 1904 the Standard Ideal Company was incorporated in the Province of Ontario to do business along the same lines as the Standard Sanitary Company, and began using labels, advertising material and catalogues extremely similar to those used by the latter company.

The Standard Manufacturing Co., alleged and proved that the opposite party had assumed the name "Standard" in order to take advantage of the reputation of the plaintiff's ware and of passing off other ware as being "Standard" It was proved that the manager of the Standard Ideal Company was fully aware of the plaintiff's business in Canada when he selected the name for his company.

Two letters were exhibited asking the trade-mark people to make their label in the precise shape and shade of coloring as the Standard Manufacturing Company's labels. Also the Standard Ideal Company's catalogue had been made in its essentials from photographs taken directly from the catalogue of the other company. The plaintiff demanded that the Standard Ideal Company should be prohibited from the use of word "Standard" in any matter regarding the sale of goods, labels, advertisements or anything to do with trade.

The judge held that the use of the word "Standard" by the Standard Ideal Company was of a nature to deceive the public into the belief that the goods were those of the Standard Manufacturing Company, and he granted the injunction asked.—"Montreal Star," May 15th, 1909.

This injunction restrains the Standard Ideal Co., Limited, Port Hope, Ont., from using the word Standard in connection with Bath Tubs, Lavatories, Sinks, Laundry Trays and other articles of toilet use and their attachments either by stamping upon the goods or by circulars, advertisements, or otherwise and they are ordered for all time to refrain from using the said word Standard and from representing their goods as being the manufacture of the Plaintiff.

Standard Sanitary Mfg. Co.
Pittsburgh, U. S. A.
Toronto Warerooms: 59 Richmond St. East
Montreal Office: 39 St. Sacrament St.

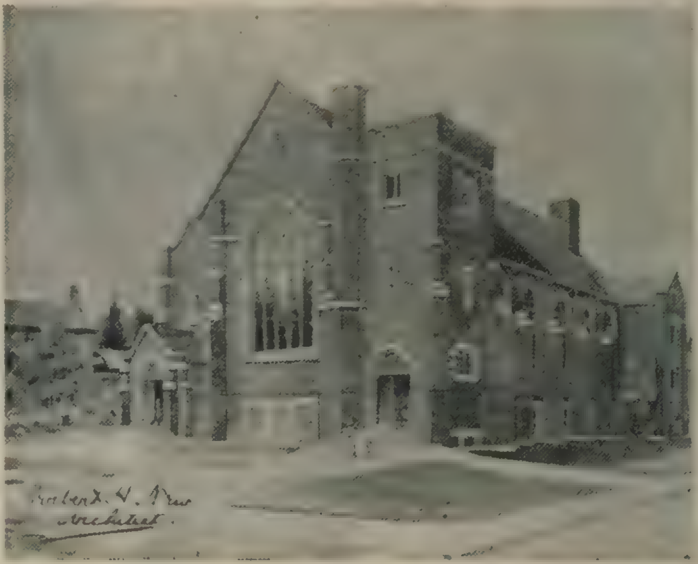
measles, which indicate incipient dry rot. It is similarly by inspection only that one can see if there are waney edges or shakes. On the other hand, a lengthy piece can be best tested by sound for the presence of any hidden defect, by getting someone else to tap one end while you listen at the other. The sound should be heard with perfect distinctness, even the ticking of a watch being discernible through a log 40 feet long, if it is thoroughly sound and well seasoned.

Structural Metal Work.

Speaking generally, structural metal work should be subjected to more severe tests than can be applied without heavy testing machinery, but all the same a certain amount can be done. Cast iron work should be tapped with a light hammer gently all over, in order to discover any hidden bubbles by means of sound; while steelwork can occasionally be tested by bending, though it is a test which hardly ought to be applied unless it has been specified, and the degree of bending stated to which samples may be taken under certain conditions. It is different with lead, for the principal defect to be looked for is an insufficiency of weight. It is even said that, say, 5 pounds of lead can be supplied either "light" or "heavy," as may be ordered, and the "light," of course, weighs less than 5 pounds per square foot, and ought to be refused. Thickness gauges are to be obtained for testing this; but the differences are so slight that they are not to be relied upon so completely as the actual weighing of a sample square foot cut from bulk. It is possible to use a scrap of smaller size for weighing, but in spite of the waste incurred it is much better, if there is any suspicion, to cut an exact square foot out of a sheet than to trust the smaller piece, whose exact area and weight it may not be easy to determine.

The Herkimer Baptist Church, Hamilton, Ont.

The Herkimer Baptist Church, illustrated herewith, is the design of Mr. Herbert H. New, architect, 608 Spectator Building, Hamilton. Tenders for this church closed recently and construction will be started at once. The building will be of red brick, made up in Flemish bond, with white joints; cut stone trimming; grey slate roof. The main auditorium will have a seating capacity of 650. There will be a commodious Sunday school auditorium in the basement, together with parlors, kitchen, library and numerous classrooms.



Herkimer Baptist Church, Hamilton, Ont.

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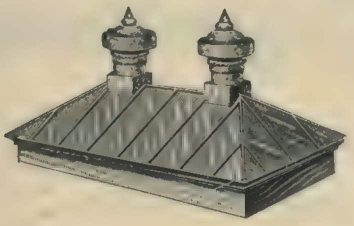

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Herringbone Metal Lath

is the stiffest on the market. Weak, flimsy grades require more furring and more plaster. The rib idea means stiffness in everything from umbrella frames to the stiffening angles on steel girders. Means it in metal lath too. If you want stiff lath get Herringbone Lath. It is ribbed.

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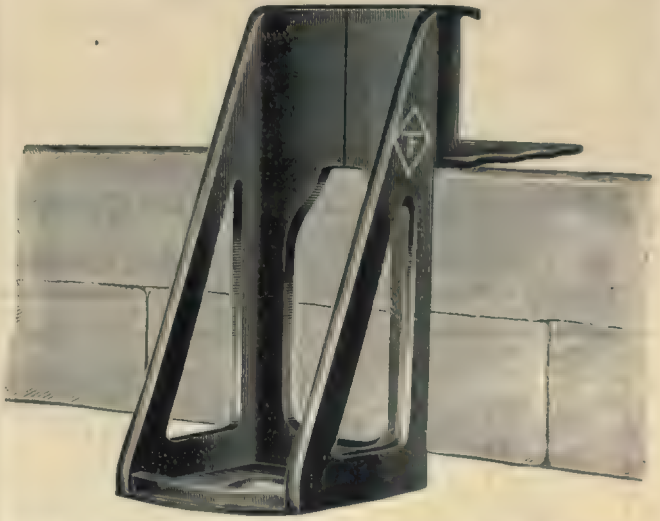

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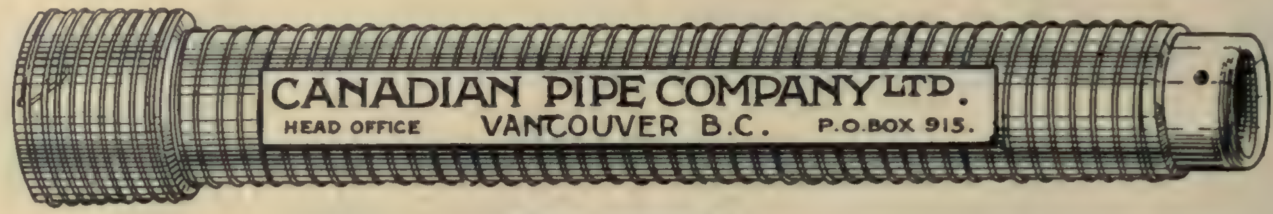
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Limited
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making extensions to, or installing systems of Water Works, should send us their inquiries regarding Hydrants, Valves and Valve Boxes.

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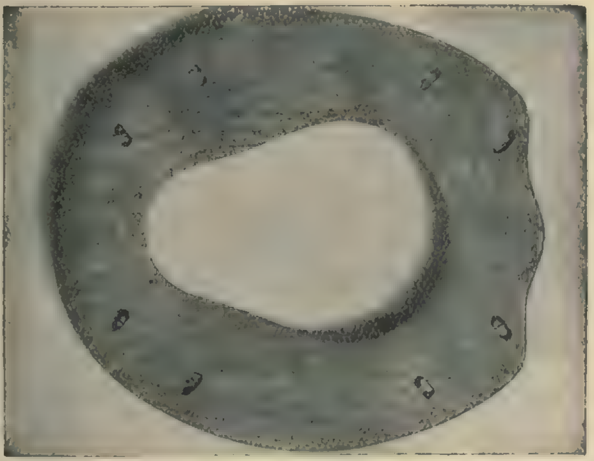
"Never-Split" Seats



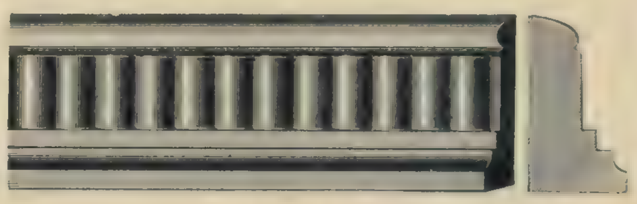
The ordinary closet-seat depends on glue alone to hold it together at the joints. The **"Never-Split"** seat is held by iron bolts and nuts sunk into the wood. They are the most lasting form of closet-seat construction by virtue of the vise-like grip of the bolts.

"Never-Split" seats embody all the style, beauty, sanitary perfection and lasting qualities that it is possible to put into them. We are sole manufacturers of this line for Canada.

Order through your jobber or supply house, but always specify our goods. Catalogues on application.

Goderich Organ Co. Limited. Goderich Canada

Artistic Decoration Gives Character



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Many of our Mouldings are carried in stock. Any requirement not to be found in stock can be made to order.

We are in a position to fill all orders quickly.

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Brandon, Man.

The city will spend $77,000 this season upon sewer construction.

Barrie, Ont.

The ratepayers will vote June 23rd on a by-law to raise $28,930 for installation of a sewerage system for wards five and six. Plans have been prepared in this connection by C. H. Mitchell, Toronto.

Cobourg, Ont.

Tenders for concrete sidewalks closed May 31st with D. H. Minaker, town clerk.

Clinton, Ont.

Tenders are invited for sections of proposed waterworks system. (See advertisement.)

Moncton, N.B.

City Engineer Edington will place in next year's estimates an item for the construction of a trunk sewer for the Dunlap property. Estimated cost, $2,000.

Montreal, Que.

John R. Barlow, city surveyor, gives notice of the city's intention to construct a sewer on Boyer street, from the end of the present sewer to a distance 2,250 feet north.

The Waterworks Committee have asked the Finance Committee for a grant of $457,000 for the completion of the acqueduct works.

At a recent meeting of the Water Committee, Superintendent Janin reported that last year the Roads Committee spent $400,000 in sidewalks, and on account of that expenditure the Water Committee was compelled to spend $18,000 to put in water service, etc. This year the Roads Committee proposed to expend $1,000,000, thereby necessitating an expenditure by the Water Committee of $50,000. The committee was accordingly asked to recommend that the Finance Committee apportion that amount to be used for the streets which the Roads Committee was permanently paving.

North Toronto, Ont.

Tenders for concrete sidewalks on Yonge street and Glencairn avenue closed May 31st with W. J. Douglas, town clerk.

North Bay, Ont.

Tenders will be received by the town for constructing cement sidewalks. (See advertisement.)

Oak Bay, B.C.

The ratepayers have approved a by-law to raise $30,000 for the installation of a waterworks system.

Ottawa, Ont.

The Nepean Township Council is considering extensive sidewalk construction in Riverside, Mechanicsville, 4th concession, 5th concession, Hamill and Caldwell.

Tenders will be called shortly for the paving of Rideau street between King Edward avenue and the Carlton general hospital. Six long blocks are embraced in this area. City Engineer Ker is now preparing estimates.

Owen Sound, Ont.

The date of receiving tenders for waterworks supplies has been extended to Thursday, June 12th. (See advertisement.)

Peterborough, Ont.

Tenders are invited by the Water Commissioners for extensive work in connection with waterworks. (See advertisement.)

Quebec, Que.

Tenders addressed to W. D. Baillairge, city engineer, will be received until June 2nd for paving certain streets in this city. Specifications and forms of tender may be obtained on application.

Tenders addressed to J. Woods, Secretary-Treasurer, Quebec Harbor Commissioners, will be received until June 10th for paving a portion of the cross wall and embankment roadways. Plans and specifications may be seen at the office of the Harbor Commissioners.

St. Thomas, Ont.

The council is considering several paving projects recommended by the Board of Works.

Vancouver, B.C.

At a recent meeting of the City Council, City Engineer Clement outlined plans for the construction of trunk mains involving an expenditure of $133,250. Various plans were submitted. The first was the only one on which detailed estimates were supplied, the figures being as follows:- Box outlet through city yard, $2,400; Lansdown avenue and Alberta street, concrete and brick sewer, 5 feet in diameter, $44,500; Ninth avenue (Westminster avenue-Alberta street), concrete and brick sewer, 4 feet and 3 feet 9 inches in diameter, $45,200; Westminster avenue, Ninth to Sixteenth avenue, pipe sewer, $18,000; Alberta street, Ninth to Twelfth avenue, pipe sewer, $8,200; Twelfth avenue, Alberta street to Manitoba street, pipe sewer, $6,250; Manitoba street, Twelfth avenue to Sixteenth avenue, pipe sewer, $8,700; total, $133,240. If the inverts only of the concrete sewers are lined with brick it should effect a saving of about $5,000, and the engineer will endeavor to get further information on the subject before the work is undertaken. City Engineer Clement reported that he was now working on the sewerage problems of three other districts, Cedar Cove, McLean drive and Fairview.

Winnipeg, Man.

Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until June 4th for the construction of a sewer in Dudley avenue, from John to Hugo. Plans and specifications may be seen at office of City Engineer Ruttan.

AWARDED.

Brandon, Man.

R. E. Rice has been awarded the contract for supplying stone for trunk sewer at $5 per cord.

The City Council recently opened tenders for 7,500 lineal feet of 16 inch cast iron water pipe in 12 foot lengths, 144 pounds to the foot, and 5 tons of special castings. The contract was given to the Canadian Iron Corporation, of Montreal, whose price for straight pipe was $34.90 and for specials $59. There were six tenders.

Halifax, N.S.

The contract for supplying the city with cast iron water pipe has been awarded to W. Beverley Robinson, of Montreal, agent for the Stanton Iron Works Company, Limited, near Nottingham, Eng.

Kildonan, Man.

At a recent meeting of the Council, the following contracts were awarded: Sidewalk, East Kildonan road, Albert Whale, $1.50 per 100 lineal feet; grading and ditching, Templeton road, George Taylor, 13 1-2 cents per cubic yard; grading and ditching Four-mile road, George Taylor, 14 cents per cubic yard; grading, Planet road, J. Nelson, 11 cents per cubic yard; sidewalk construction, Main road, Flett & Burke, $1.50 per 100 lineal feet.

Lethbridge, Alta.

The city recently invited tenders for 20,000 yards of cement walks, etc. The contract was given to Batchelor, Marshall & Skairn, of Calgary, whose prices were: Walks, $1.65; crossings, $2.36. Other tender: Forest City Paving & Construction Company, Regina, Sask., walks, $1.65; crossings, $2.46, per square yard.

Moncton, N.B.

At a recent meeting of the Council, the contracts for sewer construction and for cast iron manhole covers were awarded to Le Blanc & Gavong, and Abrams & Sons, respectively. Tenders for sewer construction were as follows: Daniel Gotro—McAllen Place $342.39, Park and Pine streets $420, Bridge street $1,500, total $2,262.39; Le Blanc & Govang—McAllen Place $284
Le Blanc & Govang — McAllen Place $284.22, Park and Pine streets $360.50, Bridge street $1,332, total $1,976.82; August T. Govang—McAllen Place $273.20, Park and Pine streets $375.50, Bridge street $1,344.50, total $1,993.20; M. C. Lodge—McAllen Place $409.05, Park and Pine streets $507.50, Bridge street $1,762.50, total $2,679.05. Tenders for cast iron manhole covers were as follows: R. F. & M. Company, $2.50 per 100 lbs.; John Abrams & Sons, $2.50 per 100 lbs.; Canada Iron & Foundry Company, Londonderry, $2.75 per 100 lbs.

Smith's Falls, Ont.

Tenders will be received by the town for the construction of concrete walks. (See advertisement.)

Saskatoon, Sask.

The ratepayers have approved a by-law to raise $10,000 for purchase of road machinery.

Vancouver, B.C.

The contract for the construction of ten miles of cement walks has been awarded to Palmer Bros. at 11 7-10 cents per foot. Scott & Ledingham tendered at 12 cents; Lawrence & Hull at 13 cents, and D. G. McKenzie at 13 3-4 cents.

The lowest tender received by the Council for the block paving of Georgia street from Burrard to Beatty was $61,053, submitted by M. P. Cotton, who is recommended for the contract. Other tenders were as follows: T. R. Nickson & Company, $64,984; Ironside, Rannie & Campbell, $68,707.05; Christian & Hartney, $61,788; Palmer Brothers, $61,357; Lawrence & Hull, $64,297.50.

Winnipeg, Man.
The City Council have given a contract for 20,000 pounds 1 inch and 30,000 pounds 3-4 inch lead pipe to the James Robertson Company, Limited, of Winnipeg, whose tender was $4.70 per 100 pounds. Other tenders were: Canada Metal Company, Winnipeg, $4.71; Northern Electric and Manufacturing Company, Winnipeg, $5.39.

Railroads, Bridges and Wharves

Dundalk, Ont.
Tenders addressed to I. Traynor, engineer, will be received until June 16th for the erection of a reinforced concrete bridge on the county line between Grey and Dufferin. Length of span, 60 feet steel; width of roadway, 14 feet.

Edmonton, Alta.
Steel laying on the G. T. P. ninety-mile gap between Edmonton and Wainwright has been commenced, and the grading of the C. N. R. branch from Vegreville to Camrose and Calgary will be started at once.

The proposed route of the C. N. R. from this city to Vancouver and New Westminster has been approved by the Department of Railways and Canals.

Little Current, Ont.
Construction work on the extension of the Manitoulin and North Shore Railway to Little Current, on Manitoulin Island, will commence next month. The line has been completely surveyed between Sudbury and Little Current, and tenders will be called within a few days for the first section to be constructed, of about ten miles. The part of the line which the railway is now operating between Sudbury and Gertrude Mine will be improved.

Montreal, Que.
It is stated that a British ship-building firm has decided to build a large dry dock at Longue Pointe at a cost of $2,500,000. Six expert engineers employed by the shipbuilding firm have made a thorough examination of the St. Lawrence, and after a consultation with Major G. W. Stephens, president of the Harbor Commission, have decided to build at once.

Melville, Sask.
The final survey of the Melville to Yorkton branch has been completed.

Quebec, Que.
According to a semi-official announcement from Ottawa, Messrs Vautelet, Mojeska and Fitzmaurice, the engineering commission appointed by the government, have prepared plans for the new Quebec bridge. Should these plans be approved, tenders may be called for and the contract let at an early date. It is stated that the present piers, which cost a million and a half dollars, will be utilized for the new bridge, which will have a span almost as great as the 1,800 foot span of the wrecked bridge. Instead of the single tower, which was the weakness of the first bridge, the present piers will probably be duplicated on the river side, thereby reducing the central span to about 1,600 feet. The structure will be on the cantilever principle, and will be built of nickel steel.

Regina, Sask.
The G. T. P. line from Melville to Yorkton and Regina will be completed this season, according to Vice-President Wainwright.

St. Marys, Ont.
The ratepayers have approved a by-law granting a bonus of $20,000 to the St. Marys and Western Ontario Railway Company for the extension of the line from St. Marys to Exeter.

Saskatoon, Sask.
The ratepayers have approved a by-law to raise $2,100 for the C. P. R. supplementary sum given for strengthening the bridge for traffic attachments.

Winnipeg, Man.
The Grand Trunk Pacific is preparing to start work on the branch lines at once, and announcement of the letting of important contracts will be made shortly. All the stations on the main line west of Edmonton as far as MacLeod River have been located and named. Hargwen is the station at Pembina River, and Edson is the divisional point west of MacLeod.

The ratepayers will vote on June 24th on a bylaw to raise $400,000 by debentures towards the construction of an overhead viaduct over the C. P. R. property between Brown and Brant streets and to reconstruct the superstructure of the Louise and Main street bridges.

AWARDED.

Kildonan, Man.
The contract for the construction of a culvert over McLeod's Creek has been awarded to McManus & Marocco at $900.

O'Connell, Ont.
The contract for the construction of a reinforced concrete arch, 58 feet span, has been awarded to Gagne & Jennings, Toronto.

Port Arthur, Ont.
In connection with the extension of the street railway, a contract for 90 tons of 60-pound steel rails and nuts and bolts was given to the Marks-Clavet-Dobie Company at a recent meeting of the Electric Railway Commissioners.

Stewartville, Ont.
The contract for the Dochart Creek Bridge has been awarded to the Jenks-Dresser Company, of Sarnia. Following are the tenders submitted: Jenks-Dresser Company, Sarnia, $2,850; Thos. John Morgan, Arnprior, $3,271; Ed. B. Merrill, Toronto, $3,390; Frood & Smith, Renfrew, $4,300; Brennan & Murphy, Arnprior, $4.490; Ray & W. J. Moor, Arnprior and Pembroke, $4,905.

Scarboro', Ont.
Tenders were recently opened for the Highland Creek Bridge. The tenders for the steel bridge were: R. McManus, $1,000; Hamilton Bridge Company, $1,000; Ontario Bridge Company, $855. For the abutments: A. K. McNairn was the lowest at a price per yard which figured out in the neighborhood of $1,200. Harrington Bros. were abotu $250 higher; E. C. Lewis, of Toronto, $100, and R. McManus, of Hamilton, $350 greater. The tender of the Ontario Bridge Company was accepted for the steel work, and that of Alex. McNairn for the aboutments. Frank Barber, C.E., Township Engineer.

Winnipeg, Man.
Several contracts have recently been let by Mackenzie & Mann for the construction of extensions to the C. N. R. The contracts were let to the Northern Construction Company and the Cowan Construction Company jointly, the division of the work being made by the two companies by mutual agreement. Active work will commence on a number of the contracts within the next week. The Northern Construction Company has been awarded the contract for construction of following lines: Vegreville to Calgary, 235 miles; Goose Lake extension 100 miles; Morinville branch, 50 miles. In addition to this, the company has been awarded the contract for the construction of a line eastward from Ochre river, through St. Rose du Lac, a distance of twenty miles, and 30 miles from Rapid City west. To the Cowan Construction Company there has been assigned the construction of the following lines: Maryfield extension to the southwest, 125 miles; Prince Albert branch, 30 miles; Oak Point branch, 20 miles; Rossburn extension, 30 miles. The line west from Wakopa will be extended a distance of twelve miles, the work on which will be done by N. K. Boyd, of Carberry.

Public Buildings, Churches, Schools, etc.

Chatham, Ont.
At a recent meeting of the Board of Education tenders were opened for the proposed addition to the collegiate institute. The bids are being held over until a future meeting. Following are particulars:—Bulk tenders — J. Sparks, all work and material, $16,437; for a steel boiler $770 extra. Geo. Rayment, all work and material, $16,521; for a steel boiler, $770. W. M. Drader, all work and material, $16.537; steel boiler $770 extra. Wm. E. Link, all material and work (steel boiler) $17,965.50; cast iron boiler, $17.205.50. Gallagher & Son, all material and work, $16,346, or lumber and work, $4.740, and $770 extra for steel boiler. B. Blonde Company, all work and material, $18,445, and $780 for steel boiler. Brunston & Hill, $19,936 for work and material if steel boiler is used; if not deduct $500. Separate tenders.—Mitchell Bros., steam heating and cast iron boiler; $2,850 tubular boiler. Mitchell Bros., steam heating and fixtures for $3,160, or $3,820 according to boiler installed. John Watt & Sons, plumbing, steam heating, etc., $2,678, or $3,438 for steel boiler. Park Bros., boiler, $1,225. Westman Bros., steam heating (tubular boiler), $2,800; (sectional boiler), $2,300; plumbing, $1,150; galvanized i ronowrkSHRDLUSHRD 150; galvanized iron work, $250; ceiling, $450; gas piping. included in steam heating tender. J. C. Wanless, metal ceiling, $325; roofing, $260. Campbell & Callahan, roofing, ceiling, flashings, etc., 742. Stephens & Douglas, roofing, $196.16, $185.26 or $163.46, according to material used; ceiling, $429.65; galvanized iron work, $231.72. W. H. Harper, masonry work and material, $6,865. John McMillan & Company, masonry work and material, $6,735. Tomlinson & Tummon, roofing, $154; iron flashing, $30; blackboards, $155. R. Tipping & Company, plastering, $1,031.14. J. A. Hildreth, painting, glazing, etc., $684. W. H. Palmer, painting, glazing, etc., $750. Cleste Blonde, plastering, $772.00. F. Millburn, plastering, $386. Wm. Robertson, work and material for all branches but plumbing and heating, $14,057. W. E. Link, carpenter work and material, $6,387.50. J. C. Wanless, metal ceiling, $325; roofing,

$260. Chatham Gas Company, electric wiring, $110.

Eganville, Ont.

The congregation of the Roman Catholic church here is planning the erection of a large three storey parishioners' club building.

Halifax, N.S.

Over $100,000 has been raised in this city for the erection of a new Y. M. C. A. building. A new building will be erected at a cost of $120,000.

Hintonburg, Ont.

Tenders for a new school building for the Separate School Board close June 4th. A. McNicholl, Ottawa, is secretary-treasurer.

Indian Head, Sask.

The plans for the new C. P. R. station to cost $20,000 are completed.

Kingston, Ont.

At the next meeting of the board of the general hospital, a special committee will report upon the question of erecting a tuberculosis hospital.

Moosomin, Sask.

Tenders for erection of high school building close June 7th with Thos. Marshall, secretary treasurer, Moosomin High School Board.

Moose Jaw, Sask.

The Presbyterians will erect a large residental college in this city. J. Balfour, Rev. E. Henry and E. B. Hutcherson, of Regina, are interested.

Montreal, Que.

A permit has been issued for the new technical school to be erected at the corner of Sherbrooke and Mance streets at a cost of $387,000.

A new school building will shortly be erected in the Roman Catholic parish of St. Edwards, in the north end of the city, at a cost of $30,000. In the same vicinity will be erected a house for the Brothers of the parish at a cost of $20,000. The architect for both buildings is J. A. Karch, and the contractors, A. Filion & Company.

The Hospital Board have received from the Hygiene Committee a report in favor of the construction of the proposed Hospital for Incurables at an estimated cost of $150,000.

Chief Tremblay, of the fire department, is submitting a report to the Finance Committee asking for five new fire stations, estimated to cost $107,000.

New Liskeard, Ont.

The township of Hudson will build a two storey brick veneer school building at a cost of from $2,000 to $3,000. L. C. Wydeman, Cochrane, Ont., architect.

Ottawa, Ont.

The city has been granted a permit for an exhibition grand stand to cost $77,375.

The City Council have passed a bylaw authorizing the execution of the agreement with the Anti-Tuberculosis Association for the erection and maintenance of the new home for consumptives.

Port Arthur, Ont.

Tenders addressed to J. W. Morgan, secretary treasurer of the Board, will be received until June 7th for the erection of the new collegiate institute in this city.

Stratford, Ont.

A committee from the hospital trust will wait upon the City Council and County Council with a view to obtaining grants for the extension of the hospital.

Saskatoon, Sask.

The school board has decided to secure fresh plans for the proposed Nutana school. The building will cost $50,000.

The ratepayers have approved a bylaw to raise $125,000 for a new collegiate institute; also a measure to raise $36,000 for the extension of the power house, and $5.000 for the erection of temporary city offices.

St. Thomas, Ont.

Tenders will be received until June 5th for the erection of a concrete, stone and brick church building. Plans with Rev. J. R. Gundy, 14 Balaclava street, St. Thomas. J. L. Wilson, Son & Arnold, Chatham, Ont., architects.

Tenders for the material and building of a schoolhouse in S. S. No. 21, Township of Southwold, will be received up to June 3. Plans may be seen at the school inspector's office, St. Thomas, or at Hay's bookstore. W. L. Walker, Box 11, Lawrence Station.

Toronto, Ont.

The Central Canada Synod of the Evangelical Lutheran Church at its recent convention in this city decided to proceed with the erection of a seminary in Toronto be affiliated with Toronto University. For particulars address Rev. H. Kroushore, Brantford, Ont.

The negotiations looking towards the amalgamation of Grace and Western Hospitals are progressing satisfactorily. It is understood that a new hospital will be erected on the Western Hospital site and that $100,000 voted by the ratepayers for the enlargement of the two hospitals will be devoted to the new building. Plans for the hospital are being prepared and tenders will be invited in the near future.

Victoria, B.C.

The city engineer is preparing plans for estimates for the erection of five public conveniences in this city.

Tenders addressed to F. C. Gamble, Public Works Engineer, will be received until June 10th for the erection of a large frame school house in the Delta municipal school district. Plans, specifications and forms of tender may be obtained at the offices of the government agent, at New Westminster; N. A. McDiarmid, secretary of the School Board, Ladner, B.C., and at the Public Works Department, Victoria.

Winnipeg, Man.

It is expected that tenders will shortly be taken for the construction of a new Temple for the Oddfellows. Architects, Chisholm & Sons. Estimated cost, $50.000.

The School Board are considering the matter of submitting to the ratepayers a bylaw to raise $250,000 for the extension of the general hospital and $50,000 for establishing a hospital in the north end of the city.

Westboro', Ont.

The ratepayers have approved a by-law to raise $15,000 by debentures for the construction of a six-roomed school building.

Yorkton, Sask.

The council have decided upon the erection of a hose tower on the fire hall. Estimated cost $4,000.

AWARDED.

Brussels, Ont.

Ireland & Killer, architect, Stratford, Ont., have awarded to John Hunter at $6,500 the contract for the proposed new library building.

Fernie, B.C.

At a recent meeting of the city council, J. J. Wood was awarded the contract at $5,995 for building a concrete power house.

Galt, Ont.

Contracts in connection with the six-room addition to the Central school have been awarded as follows: Masonry, Thomas & Hancock, $5,600; carpentry, Hamill Bros., $3757; painting, W. J. McLeod, $195; tinsmithing, etc., Gamelin & Company, $207; plastering, H. Guenther, $499; roofing, J. A. Rae, $325; metal ceiling, Preston Metal Shingle & Siding Company, $270.

Oshawa, Ont.

The contract for the erection of the new high school has been awarded to R. H. James at $19,975.

Winnipeg, Man.

The contract for the erection of the new provincial sanatorium at Ninette has been awarded to William Bell, of Brandon, at $50,000.

Residences

Lethbridge, Alta.

Permits have been issued to H. Boyd for a $5,000 residence on Bartlett street, to E. Adams for five houses on Redpath street to cost $1,750 each, and to D. H. Ellsie for a $3,000 house on London road.

Ottawa, Ont.

Recent building permits include: Wolf Shenkman, brick veneered dwellings, St. Patrick street, $2,000; William Hunt, brick veneered dwelling, McLeod street, $3,500; John Black, brick veneered dwelling, Frank street, $4,000; A. E. Slemon, brick veneered dwelling, Bronson avenue, $4,000; Thomas Clarey, solid brick dwelling, Centre street, $2,000; P. J. Brennan, three solid brick dwellings, Bay street, $4,600; D. A. Martin, double brick veneered dwelling, King Edward avenue, $5,000; J. G. Davidsno, brick veneered dwelling, Carling avenue, $3,000; Geo. Hammond, brick veneered dwelling, Chapel street, $3,500; J. H. Simpson, addition to dwelling, Strathcona avenue, $2,000; J. More, brick veneered dwelling, Second avenue, $3,000; Cleophas Perron, double brick veneered dwelling, Sussex street, $3,000.

Winnipeg, Man.

H. M. Millman has been granted a permit for the erection of an apartment block at the corner of River avenue and Osborne street at an estimated cost of $70,000. To W. J. Willoughby there has been issued a permit for a $20,000 apartment block on Nassau street. Other permits include: A. C. Garvin, house on William avenue, $2,000; Geo. Ryall, house, Pritchard avenue, $2,600; William Whyte, garage and parlor addition to house, River avenue, $5,700; H. S. Hunter, house, Mountain avenue, $2,500; J. C. Hicks, four houses on south side of Macmillan, $9,200; A. C. Galt, house, northwest corner of Yale and Guelph, $7,000; A. P. Cooper, house, Cathedral, between Salter and Powers, $2.400; Smith & Kirkpatrick, four houses, Buell avenue, between Maryland and Walnut, $4.000 each; C. H. Germain, house, Dominion street, $3,000; Mills & Outerhout, house, Victor street, $3,000; Smith, Tapley and Dow, five houses, Bannerman, between Salter and Powers, $6,000; A. McCurdy, two houses, Arlington, $6,500; Henry Graver, two cottages, Scotland, between Pembina and Nassau streets, $2,200; E. A. Tennant, dwelling, Greenwood Place, $3,000; Geo. Neil, four dwellings, Machray avenue, $6,000; H. R. Patterson, dwelling, Wardlow, $4,500; J. F. Nicholson, dwelling, Polson avenue, $2,400.

Business Buildings and Industrial Plants

Abernethy, Sask.
The buildings of the Beaver Lumber Company and others were destroyed by fire last week at a total estimated loss of $25,000.

Brantford, Ont.
The Schultz Company are stated to be planning the extension of their factory so as to include the manufacture of motor boats, etc.

Edmonton, Alta.
E. F. Kochler, of 26 Malmesbury terrace, Canningtown, London, Eng., has written to the Board of Trade enquiring with a view to the establishment of a large match factory in this city.

Fernie, B.C.
The Crow's Nest Pass Coal Company are starting upon the construction of 1,000 new ovens. It is said that these will require 500,000 feet of lumber.

J. D. Quail has obtained a permit for the erection of a concrete warehouse, 60 feet by 90 feet, on Baker avenue.

G. G. Henderson will erect a concrete block on Victoria avenue.

Granby, Que.
The premises of the Sanitary Supplies Manufacturing Company were destroyed by fire last week.

Hamilton, Ont.
W. A. Edwards has been granted a permit for additions to the premises of the Frost Wire Fence Company. Cost $10,000.

Tenders are being taken for the extension of the head office building of the Bank of Hamilton in this city. Architect, Chas. Mills, Hamilton, Ont.

The Grand Rapids Hardware Supply Company will erect a branch building in this city at the northeast corner of Sherman avenue and Biggar avenue. The company will first erect one building, 65 feet by 130 feet.

The building of Coppley, Noyes & Randall, clothing manufacturers, was damaged by fire last week.

The announcement is made that the Otis-Fensom Elevator Company has decided not to remove to Toronto, where it has been negotiating for a site at Ashbridge's Bay, but will enlarge its premises here. The company has secured twenty-eight acres of additional land, and has given instructions to Architect Mills to prepare plans for a warehouse and other buildings. It has agreed to spend $50,000 on new buildings, but the expenditure is likely to exceed this, as the company is planning to build an extensive foundry.

Halifax, N.S.
Work will commence shortly upon extensive improvements to the plant of the Dominion Iron and Steel Company. In this connection representatives of English, Belgian, American and Canadian firms have been at Sydney for some days past looking over the ground with a view to tendering for the construction of the Steel Company's new battery of coke ovens. Work will be in hand this summer and will be pushed vigorously. This will be among the first of the extensive additions which are to be made to the plant within the next couple of years. It is said that the total cost of the projected improvements will exceed $2,000,000.

Kingston, Ont.
It is stated that a Boston capitalist has presented a proposition to the Board of Trade for the erection of a big hotel in Kingston. He is asking for a free site, exemption from taxes for twenty years, and the guarantee of bonds to the extent of $100,000. In return, his company will erect a hotel to cost a quarter of a million.

London, Ont.
The warehouse of W. J. Reid & Company was destroyed by fire last week at considerable loss.

Lethbridge, Alta.
It is stated that a large flour mill is to be erected here this season by a number of Manitoba grain men.

Lumsden, Sask.
The Lumsden Hotel Company, Limited, will build a $20,000 hotel this year.

A. & G. Hunter, of this place, will spend $15,000 in barns and outbuildings.

Montreal, Que.
The St. Gabriel's church property has been purchased by J. A. Jacobs, who will erect a large block of stores on the site.

The east end abattoir of the D. B. Martin Company was destroyed by fire last week at a loss of $10,000.

The plans of the new Ritz hotel, to be erected in this city, are now being discussed, although a site has not yet been selected. Mr. Wetmore, architect, New York, was in Montreal last week arranging preliminaries with prominent men interested in the venture. The proposed new building will have three hundred rooms. Further announcement is expected shortly.

North Sydney, N.S.
At a special meeting of the Town Council a resolution was passed granting a free site, thirty years' exemption from taxation and free water for thirty years, for a smelting and reduction plant, to be erected here by J. H. Brown, of Montreal, and his associates. Mr. Brown states that the plant will cost $1,500,000.

Ottawa, Ont.
It is said that the old Y. M. C. A. building will be remodelled into a big warehouse at a cost of $100,000.

The Canada Life Assurance Company will erect a five storey office building on Sparks street at a cost of $37,000. The construction will be in brick and terra cotta. Byers & Anglin are the contractors.

A permit has been issued for alterations to the Ottawa Electric Company's building. Cost $5,000.

Port Arthur, Ont.
The Bank of Montreal will erect a large building on the site recently acquired at the corner of Cumberland and Park streets.

The Stanworth-Martin Company will make considerable extensions to its stone cutting plant this season.

The city has come to an agreement with a company known as the Western Dry Dock & Shipbuilding Company, Limited, which is planning the construction of an immense dry dock, the largest of its kind on the Canadian side of the Great Lakes. A. F. Bowman, of Southampton, Ont., is interested.

Preston, Ont.
The Kennedy Motor Car Company, Limited, will erect a motor car factory here. Geo. A. Cuare, M. P., is president and H. Kennedy, manager. The secretary treasurer is Mr. A. M. Edwards.

Port Colborne, Ont.
The Hedley-Shaw Milling Company has been granted a lease of the east elevator dock at Port Colborne, by the government, for the erection of a mammoth flour mill for the export trade. Work on the new mill must start within six months, or the lease expires. A large delegation of prominent milling men from Winnipeg, New York, Toronto, London and other places recently made an inspection of the site. It is understood the mill will cost half a million dollars.

Portage la Prairie, Man.
Tenders have just been taken for the main buildings of the Waterloo Manufacturing Company.

St. Catharines, Ont.
The jewelry store of A. L. Jackson was destroyed by fire last week. Total estimated loss $3,500.

Saskatoon, Sask.
The contract for the $75,000 warehouse of the International Harvester Company has been awarded to Carter,Halls and Aldinger, Winnipeg.

Strathroy, Ont.
The ratepayers have approved a by-law granting a loan of $20,000 to the Royal Furniture Company, who will put up a large factory this summer.

Tusket, N.S.
The lumber mill at this place, owned by Dickie & McGrath, was destroyed by fire last week. The owners will re-build immediately.

Toronto, Ont.
Tenders closed May 31st with Darling & Pearson, architects, 2 Leader Lane, for the erection of a branch building at Broadview and Danforth avenue, for the Metropolitan Bank.

The factory building at the corner of Hayter and Terauley streets, owned by N. B. Lindsay, manager of the Dominion Show Case Company, was damaged by fire last week to the extent of $2,000.

Victoria, B.C.
A. C. McCallum will erect a brick office building on Douglas street.

Extensive additions are to be made to the Dominion hotel, corner Blanchard and Yates streets. A four storey wing will be added. Address Stephen Jones, proprietor.

Vancouver, B.C.
Plans have been prepared for a $6,000 business block which will be erected by Jos. Dodson on the north side of Hastings street between Carroll and Columbia. The building will be five storeys in height and have a frontage of 52 feet on Hastings street.

Winnipeg, Man.
A permit has been issued for the new Royal Bank on Main street. Estimated cost $190,000.

Yarmouth, N.S.
The new hotel at Lake Annis was destroyed by fire last week at a loss of $2,500.

AWARDED.

Lethbridge, Alta.
The contract for the Arcade block has been awarded to R. Virtue. Estimated cost $20,000.

Smith Bros. & Wilson have the contract for the erection of the Sherlock block. Cost $30,000. Architect, E. E. Carrer.

Montreal, Que.
W. Beverley Robinson, Board of Trade Building, Montreal, agent for Doulton & Company, Limited, London, Eng., has been

awarded contracts for terra cotta for the Montreal branch of the Royal Bank of Canada; interior of medical building, McGill University, Montreal; Bank of Montreal Building, Queen and Yonge streets, Toronto.

Winnipeg, Man.
The Manitoba Bridge & Iron Works, Limited, of Winnipeg, recently secured the contract for all the structural steel and iron required for the new National Transcontinental Railway shops at St. Boniface. This contract calls for about 5,000 tons of steel, the largest tonnage awarded to any structural steel company in Western Canada for some time. The work of fabricating this steel has now been started and it is expected that delivery of the entire order will be made in about six months. The new structural steel and bridge shop now being erected by the Manitoba Bridge and Iron Works, Limited, at Winnipeg, will be the largest and most modern in Canada west of Toronto and will be completed by June 15th. In this shop, the steel work for the car shops will be fabricated.

The Manitoba Bridge & Iron Works, of Winnipeg, have been awarded the contract for structural steel amounting to 650 tons, for the Great West Life Assurance Company's new building at Winnipeg. Steel frame construction is designed for five additional storeys. This is the second largest contract for steel building construction in Winnipeg this year.

Power Plants, Electricity and Telephones

Montreal, Que.
According to a recent advice, the experiment of despatching trains in the Farnham branch of the C. P. R. by telephone has been so successful that the telephone system will be installed this summer over the whole of the Superior Division, 250 miles, between White River and Fort William. Work on installing a copper wire circuit for this purpose will be commenced very shortly. It is stated by Superintendent Murphy, of the Eastern Division, that the telephone despatching system is easily twice as efficacious as the old telegraph work, and that it is only a matter of time until the whole C. P. R. system adopts the telephone for train service despatching.

The proposed new power plant at McGill University, which is to be installed to furnish steam heat and electric power to all the buildings, is to cost about $150,000. The architect for the building is Prof. Nobbs. The dimensions of the building are 80 by 116 feet, the boiler room 80 by 48 feet, and the engine room 42 by 60 feet. The chimney will be 8 feet in diameter by 160 feet in height, and will be constructed by H. R. Henricke, of New York.

Ottawa, Ont.
J. D. Fraser, secretary of the street railway company, states that the company will proceed at an early date with the construction of the newly authorized loop lines.

Toronto, Ont.
The electrical department is receiving tenders for laying underground conduit. (See advertisement.)

Vancouver, B.C.
The construction of the 100 miles of electric railway, tapping the principal fruit growing centres on both sides of Okanagan Lake, is to be started shortly. The line will be completed within eighteen months. The enterprise was started by local capitalists, who are said to have secured the financial support of the Earl of Aberdeen, viceroy of Ireland, who is the owner of the famous Coldstream ranch near Vernon. The new company was incorporated by special act at the last session of the provincial legislature. J. F. Langan, of Chicago, is stated to be interested.

Victoria, B.C.
At the last monthly meeting of the Board of Trade, A. T. Goward, local manager of the B. C. E. R., outlined the improvements which the company is prepared to make if it can come to an agreement with the city. The company is prepared to spend $150,000 on a power plant at the Jordan river. This would have a guaranteed capacity of 10,000 h.p. The company further guarantees that the rates on electric light and power in Vancouver shall not exceed those in Vancouver. The company is to supply the light to Victoria at half the present cost, no matter what that cost was. The same guarantee applies to all extensions which may take place in future years. The B. C. Electric Company further guarantees to spend a sum of $250,000 on the extension of its lines in Victoria, within the next three years. If the city shall develop Sooke Lake for power purposes the company undertakes to purchase all the surplus water brought in through the city pipes. It is thought that an agreement will be reached.

Welland, Ont.
The N., St. C. & T. Electric Railway has agreed to extend its line from Welland to Port Colborne and have cars running in three months, provided satisfactory terms can be made with Port Colborne. Two cars have been purchased for the line at a cost of $15,000. The line will be extended east along the shore of Lake Erie from Port Colborne to Buffalo later.

AWARDED.

Vancouver, B.C.
The B. C. E. R. have awarded to Naylor Bros., of Huddersfield, Eng., the contract for the enlargement of their hydraulic tunnel connecting lakes Coquitlam and Butnzen. The cost involved in the plans now being carried out for the improvement of the hydraulic power in connection with the North Arm generating plant is $300,000. At the present time a contract is let for one electrical unit of 10,000 horsepower, and it is expected that this will be followed in a year or so with an order for the installation of another of 20,000 horsepower.

Winnipeg, Man.
The controllers have decided to take tenders for the hydraulic and electrical machinery for the Pointe du Bois power development. Tenders are to be in by August 16th. The value of the machinery for which bids are to be called is estimated at $450,000.

Miscellaneous

Burlington, Ont.
Tenders closed June 1st with O. T. Springer, clerk and treasurer, for purchase of $47,200 4 1-2 per cent. 30-year waterworks debentures of this village.

Fort William, Ont.
The Fort William Forwarding & Warehousing Company has been organized for the purpose of supplying a clearing house for package freight received by boat and rail. The company have secured 1,000 feet of river frontage in the Wayland addition, and a dock the full length of the frontage will be built.
Toronto, Ont.

Kinistino, Sask.
John Stuart, government engineer, is here in connection with the proposed drainage of Water Hen Lake, which covers about 12,000 acres. He will report in favor of the project.

Kingston, Ont.
Tenders for repairs to concrete gas holder tank will be received until June 19th by H. B. Craig, City Engineer.

Loggieville, N.B.
Tenders addressed to M. J. Butler, Chairman, Government Railways Managing Board, Ottawa, will be received until June 10th for construction of a three-stall engine house, turntable, ringwall, with centre foundation, freight shed, loading platform, and for the alterations and additions to the station building. Plans and specifications may be seen at the station master's office, Chatham, N.B., and at the chief engineer's office, Moncton, N.B., where forms of tender may be obtained.

Montreal, Que.
Recent building permits have been issued as follows: House for Brothers connected with St. Edward's parish, $20,000; school, St. Denis Ward, $30,000; J. Trottier, five dwellings, Richmond street, $10,000; Mrs. R. Prefontaine, house, St. Louis Square, $7,000; L. Primeau, three dwellings, Beaudry street, $3,800; A. Gravel, five dwellings, Brebeul street, $5,000; L. Sauve, five dwellings, Brebeuf street, $4,000; P. J. Dumont & Company, four dwellings, St. Andre street, $4,000; G. W. Faust, three dwellings, Sherbrooke street east, $4,000.

Toronto, Ont.
The by-law to spend $700,000 on the proposed sea wall will be submitted to the ratepayers on June 5th.

Recent building permits include: A. G. T. Robinson, 3 storey brick store and dwelling, Queen street east, $4,500; Love Bros., Limited, 3 detached 2 1-2 storey brick dwellings, Fairview avenue, $10,000; Wm. Hodgkinson, pair semi-detached 2 1-2 storey roughcast dwellings, brick fronts, Elliott, $4,000; J. H. Locke, 3 attached 2 storey brick dwellings, Deleware avenue, $6,000; H. M. King, pair semi-detached 2 1-2 storey brick dwellings, corner Galley avenue and Sunnyside, $4,500; Mr. Graham, 2 1 2 storey brick dwelling, Labernam, $3,500; D. Lavine, 2 1-2 storey brick dwelling, Beverley street, $3,500; Chas. Heatherington, pair semi-detached 2 storey brick dwellings, Marion, $4,000; T. P. Stewart, 2 1-2 storey brick dwelling, Lynwood, $8,000; R. S. Booth, pair semi-detached 1 1-2 storey brick dwellings, near Bernard, St. George street, $8,000; W. E. Wild, pair semi-detached 2 storey and attic brick dwellings, Globe, $3,000; Grimshaw Bros., 2 storey store and dwelling, College street, $3,500; W. Pugh, pair semi-detached 2 1-2 storey brick dwellings, Constance avenue, $5,000; J. G. Kent, pair semi-detached 2 storey and attic brick dwellings, corner Rusholme and Hepbourne, $6,000; H. Galbraith, 2 1-2 storey brick dwelling, Wright, $3,600; Sykes & Knox, 2 pairs semi-detached 2 storey brick dwellings, Brock avenue, $8,000; W. J. Fulton, 2 storey and attic brick dwelling, Bathurst street, $3,000; James Stewart,

(Continued on page 25)

Tenders and For Sale Department

Limestone

200 acres hard and building limestone, 82 miles from Toronto. 200 rods distant, on two road allowances, from Canadian Northern Ontario track. Deposit over fifty feet thick. Large dwelling house, barn, stables, and good well on property. Will sell whole or part. A rare opportunity to secure, at reasonable prices, unlimited supplies of first class limestone near railway with accommodation for men and teams. W. M. SHIELDS, O'Connell, Ont. 22

Tenders for Construction of

Granolithic Sidewalks

Sealed Tenders, addressed to M. W. Flannery, Town Clerk, will be received by the Corporation of the Town of North Bay, Ontario., until twelve o'clock, noon, 14TH JUNE, 1909, for the work of supplying material and constructing approximately 50,000 square feet of Cement Sidewalks.

Plans, Specifications, Forms of Proposals, at office of

L. O. CLARKE,
Town Engineer.

The lowest or any tender not necessarily accepted

23

CITY OF BRANTFORD

Tenders for Sewers

Sealed Tenders addressed to Ald John Moffat, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock noon on

THURSDAY, JUNE 10TH, 1909

for the furnishing and laying of about 6,000 lineal feet of sanitary sewers on Scarfe, Gilkison, Brant and Oxford Streets, 12 inch and 9 inch in diameter, together with necessary manholes.

Plans and Specifications may be seen and Instructions to Bidders and Forms of Tender obtained at the City Engineer's Office.

Each tender must be accompanied by a marked cheque for 5 per cent. of the amount of the tender.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.
City Engineer's Office,
City Hall, Brantford,
May 22nd, 1909.

22

Tenders for

Waterpipe and Cement

Town of Owen Sound

Sealed tenders, addressed to the Chairman Waterworks Committee, will be received up to 6 p.m. on SATURDAY, JUNE, 12TH 1909, for the following paproximate quantities:—

Waterpipe	18 inch D.		3,000 ft.
	12 "		20,000 "
Lead			14 tons

Also Hydrants, Valves, Venturi Meters, Specials, &c.

Portland Cement			4,000 bbls.
Sewer Pipe	24 inch		1,100 ft.
	12 "		1,470 "
	9 "		2,400 "
	12 "	split	264 "
	9 "	"	80 "
	6 "	"	1,600 "

Also Y's, T's, &c.

Specifications sent on application.

The lowest or any tender not necessarily accepted.

R. McDOWALL, C.E.,
Town Engineer.

JOHN McQUAKER,
Chairman Waterworks Com.

23

Tenders

will be received by the City of Toronto, Canada up till noon of JUNE 30TH, 1909, for laying between 350,000 and 450,000 duct feet of underground conduit.

For specifications, form of tender, etc., apply Electrical Department, City Hall. 25

Tenders for

Concrete Walks

Sealed Tenders, endorsed on the envelope "Tenders for Concrete Walks," and addressed to the undersigned, Smith's Falls, Ontario, will be received up to 4 o'clock p.m., on MONDAY, THE 7TH OF JUNE, 1909, for the construction of approximately 50,000 square feet of Concrete Walks in the Town of Smith's Falls. Plans and specifications may be seen at the office of the Town Engineer. No tenders necessarily accepted. A marked cheque for the sum of $200.00, payable to the Treasurer of the Town of Smith's Falls, must accompany each tender.

J. A. LEWIS,
Town Clerk.

Smith's Falls, 27th May, 1909. 22

Peterborough, Ontario

Waterworks

Sealed tenders, addressed to the undersigned, are invited by the Peterborough Water Commissioners, for the necessary Excavation, Coffer Dams, Concrete Dam and Pump House, Foundations, etc., for waterworks purposes, on the Otonabee River near Peterborough, Ontario, and will be received up to MONDAY, THE FOURTEENTH DAY OF JUNE, prox., at noon.

Specifications will be furnished, and plans may be seen at the office of Mr. W. Henderson, Superintendent Waterworks, Peterborough, Ontario, or at the office of the Designing Engineer, Mr. William Kennedy, Jr., Y.M.C.A. Building, Montreal, on or after the Fourth day of June, prox.

No tender necessarily accepted.

S. R. ARMSTRONG
Secretary,
Water Commissioners
Peterborough, Ont.

22nd May, 1909

23

CITY OF BRANTFORD

Tenders for Pavement

Sealed Tenders addressed to Ald. John Moffat, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ont., will be received till 12 o'clock noon on

THURSDAY, JUNE 10TH, 1909

for the pavement of Queen and George Street:

(a) About 6,000 square yards of concrete foundation including grading.

(b) About 6,000 square yards of top surfacing, (tenders for different kinds will be received).

(c) About 3,000 lineal feet of concrete curb and gutter.

Separate tenders are required for a, b and c. A guarantee bond for the maintenance of the pavement for 10 years will be required.

Plans and Specifications may be seen and Forms of Tender obtained at the City Engineer's Office.

Each tender must be accompanied by a marked cheque for 5 per cent. of the amount of tender.

The lowest or any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.
City Engineer's Office,
City Hall, Brantford,
May 22nd, 1909.

22

Tenders for Repairs to

Concrete Gas Holder Tank

Sealed tenders addressed to H. B. R. Craig, City Engineer, and marked "Tenders for Gas Holder" will be received up to 12 o'clock noon, the 19TH DAY OF JUNE NEXT, for the repair of the Concrete Gas Holder Tank belonging to the Corporation of the City of Kingston, Canada.

Information and general specifications may be obtained upon application to the undersigned.

The lowest or any tender not necessarily accepted.

(Signed) H. B. R CRAIG,
City Engineer.

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TOWN OF CLINTON

Province of Ontario

Water Works

Sealed Tenders will be received by the Town Clerk until 8 p.m., on

TUESDAY, JUNE 29TH, 1909

for the following sections of the proposed Water Works System:

"A"—Labor Pipelaying
"B"—Pump House
"C"—Water Tower
"D"—Cast Iron Pipes
"E"—Hydrants, Valves, etc.
"G"—Pumping Machinery
"H"—Producer Gas Plant
"L"—Receiving Basin

Plans and specifications may be seen at the Town Hall, Clinton, or at the office of the Chief Engineer, 103 Bay St., Toronto, on or after June 8th.

D. L. MACPHESON, Esq.,
Clerk,
Clinton, Ont.

H. WILTSE, Esq.,
Mayor,
Clinton, Ont.

WILLIS CHIPMAN, C.E.,
Chief Engineer,
Toronto, Ont.

Dated May 28th, 1909. 24

Burlington Water Works

Tenders Wanted

Sealed Tenders will be received by the Clerk until 8 p.m., on MONDAY, JUNE 21ST 1909, for the following works:—

Contract "B"—Pump House
Contract "G"—Electrically Operated Pumping Machinery.
Contract "I"—Steel Pump Well.

Plans and specifications may be seen at Burlington, or at the office of the Chief Engineer, Toronto, on and after Juue 8th.

M. C. SMITH, Esq.,
Chairman,
Burlington, Ont.

O. T. SPRINGER, Esq.,
Secretary,
Burliugton, Ont.

WILLIS CHIPMAN, C.E.,
Chief Engineer,
103 Bay St., Toronto, Ont.

22

Positions Wanted or Vacant

WANTED—Machinist and also Millwright wanted, for cement mill. Apply stating experience and wages to Box 777, CONTRACT RECORD, Toronto. 22

WANTED—Competent Marble and Granite Letterer; must be first-class and sober. Apply Box 775, CONTRACT RECORD, Toronto. 22

Tenders for Bridge

Sealed Tenders, addressed to Wm. Purves, Esq., Clerk of East Whitby Township, Columbus, Ont,, will be received until noon, on TUESDAY, JUNE 15TH, for the building of a 40' Reinforced Concrete Arch Bridge, near Oshawa.

Plans and specifications may be seen at the office of the Engineers.

The lowest or any tender not necessarily accepted.

BOWMAN & CONNOR,
Engineers,
36 Toronto St., Toronto.

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Miscellaneous

(Continued from page 23)

pair semi-detached 2 storey and attic brick dwellings, Crawford street, $5,000; R. & J. Walker, pair semi-detached 2 storey brick dwellings, Globe, $4,000; H. B. Reesor, pair semi-detached 2 storey and attic brick dwellings, Gladstone avenue, $5,500; W. E. Lunn, 2 storey and attic brick dwelling, Bathurst street, $3,600; F. B. Ward, 2 1-2 storey brick dwelling, near Howard Park avenue, on Indian road, $4,000; G. L. Wilson, 2 storey brick dwelling, Gladstone avenue, $4,000; Addison & Ritchie, pair semi-detached 2 storey and attic brick dwellings, Sunnyside, $4,800; John Boland, pair semi-detached 2 storey brick stores and dwellings, southwest corner Brock avenue, $5,000; A. A. Kennedy, pair semi-detached 2 storey brick dwellings, Wickson avenue, $4,000; J. M. Chalmers, 2 detached 2 1-2 storey brick dwellings, Binscarth avenue, $8,000; Kay Bros., 2 1-2 storey brick dwellings, Deleware avenue, $3,600; Beaches Athletic Association, pair semi-detached 2 storey brick stores and club, Queen street east, $7,000; P. Curtis, 2 1-2 storey brick dwelling, Logan avenue, $3,800; T. Blackburn, pair semi-detached 2 storey brick dwellings, Hamilton, $4,000; C. Du Massey, 2 storey roughcast addition to dwelling, brick front, Yarmouth road, $3,500; H. B. Reesor, 2 storey and attic brick dwelling, Gladstone avenue, $3,000; Kay Bros., 2 1-2 storey brick dwelling, Hogarth avenue, $3,000; R. Lankin, 3 pairs semi-detached 2 storey roughcast dwellings, brick fronts, Pape avenue, $9,600; W. F. Thomas, 2 storey and attic brick dwelling, Highlands, $6,000; E. Henderson, pair semi-detached 2 storey brick stores and dwellings, Gerrard street, $4,000; J. O. Honsberger, pair semi-detached roughcast dwellings, brick fronts, 2 storey, Globe, $3,000; Robt. Preston, 2 storey brick dwelling, High Park avenue, $4,000; Hill & Dennis, pair semi-detached 2 storey and attic brick dwellings, Constance street, $6,000; F. H. Urquhart, 2 storey and attic brick dwelling, St. George street, $5,000; Walter Casual, 2 storey and attic brick dwelling, Hewitt avenue, $3,200; Dr. R. G. McLean, 2 storey brick dwelling, Highland, $9,000; J. M. Cowland, pair semi-detached 2 storey frame dwellings, Victoria avenue, $3,200; Mrs. J. A. Porter, 2 1-2 storey brick dwelling, Russell road, $5,000; Ewart & Simmons, 2 storey and attic brick dwelling, Rusholme road, $4,000; R. D. McLeod, pair semi-detached 2 storey and attic brick dwellings, St. Clair avenue, $7,500.

AWARDED.

Granby, Que.

The Council have placed the following order for culvert pipe with the Standard Drain Pipe Company, of St. John's, Quebec: 100 feet 9 inch at 15c.; 800 feet 12 inch at 25c.; 200 feet 15 inch at 35c.; 200 feet 18 inch at 43c.; 50 feet 24 inch at 90c.

New Companies

Imperial Cement Company, Limited, Owen Sound, Ont., incorporated, capital $200,000. Incorporators, A. G. MacKay, T. I Thomson, S. Lloyd, M. Kennedy, C. A. Fleming, H. B. Bourne and A. J. Frost, all of Owen Sound.

Dennis & Company, Limited, Toronto, Ont., incorporated to carry on a general decorating, painting, wall papering and glazing business, capital $40,000. Incorporators, W. J. Dennis, A. G. Gidley, G. Roby, E. Roby and F. Stevenson, all of Toronto.

McBrien Manufacturing Company, Limited, Toronto, Ont., incorporated to manufacture and deal in hardware and hardware supplies, and to carry on the business of mechanical and electrical engineers etc., capital $40,000. Incorporators, A. W. Holmested, J. L. Ross, D. A. Brebner and W. L. Carr, all of Toronto.

Kirkfield Portland Cement Company, Limited, Toronto, Ont., incorporated, capital $250,000. Incorporators, E. L. Middleton, A. E. Knox, G. Keogh, and others, of Toronto.

Springbank Telephone Company, Limited, Fordwich, Ont., incorporated, capital $10,000. Incorporators, J. McLaughlin, R. Ferguson, J. Padfield, W. J. Strong and H. W. Laird, all of Howick Township.

Rural Telephone Company of Kitley, Limited, Toledo, Ont., incorporated, capital $10,000. Incorporators, J. Edgar, A. R. Hanton, R. T. Beckett, C. A. Wood, Jr., J. N. Stinson and E. G. Luckey, all of Kitley Township.

Business Notes

Archibald Bros., plumbers, New Westminster, B.C., have dissolved partnership.

The McNair Timber Company, Limited, Vancouver, B.C., has voluntarily wound up.

F. J. Hart & Company, Chilliwack, B.C., have sold their lumber business to Macken Bros.

Gibson & Robson, lumber and shingle manufacturers, Tynehead, B. C., have dissolved partnership.

The capital stock of the Expanded Metal & Fireproofing Company, Limited, has been increased by letters patent from the sum of $100,000 to the sum of $250,000.

G. G. Shortreed, of Barrie, has disposed of the Raven's Lake Cement Works and the power plant on the Gull river to the Scarboro' Securities for about $500,000. The power plant supplies power to the cement works, the marl pits of which extend over 360 acres and are close to the town of Coboconk.

The London Concrete Machinery Company report the following sales of their London Concrete Mixer, No. 1, recently placed on the market: The Dominion Concrete Company, Kemptville, Ont.; Hunter Bros. Bridge Works, Kincardine, Ont.; C. Jones, contractor, Galt, Ont.; Crown M. C. H. Company, Montreal, Que.; W. R. McGaw Company, Vernon, B.C.; W. H. Stafford, Laurence Station, Ont.; R. H. Smith, contractor, London, Ont.; W. F. Barnes, contractor, London, Ont.; James Stewart, contractor, Russell, Ont.; Thomas Clary, contractor, Ottawa, Ont.; Martin Jex, Contracting Company, Cobourg, Ont.; C. Montgomery, contractor, Allandale, Ont.; R. Smith, contractor, Brantford, Ont.; J. B. Osborne, contractor, Simcoe, Ont.; W. Fletcher, contractor, Nilestown, Ont.; Jas. Gough, contractor, Kingstown, Ont.; Joy & Sons, contractors, Napanee, Ont.; E. Price, contractor, Orton, Ont.; J. Schentz, contractor, Berlin, Ont.; T. J. Coleman, Markdale, Ont.; Todd & Sons, Windsor, Ont.

Pointers on Estimating

The great difference which appears in bids would suggest that there are various methods, or perhaps better, a lack of method in estimating. I have known mill estimators to vary 100 per cent. on a small bill of material, and the bids on a $10,000 building to have a difference of three to four thousand dollars between the high and the low bids.

While there are no fixed rules to go by in estimating a job where material and labor vary in different localities, yet there are methods that will be of great value to those who have no system at all. It is the practice of many contractors to get estimates from other sub-contractors on the various parts of the work, add them together, and the sum would be the amount of their bid. This way is not reliable, as you have no way of knowing that your estimate is correct, a mistake in any one of the sub-contractors who gave you figures would mean your bid was high or low. If his mistake was against him it would also be against the general contractor, and in many cases would have to stand it if he secured the job. A contractor should be able to estimate every part of the building himself. The estimator who arrives the closest to the right amount will make an accurate list of all the material and labor that is required to complete the building. Accuracy in taking off quantities is a very necessary factor in good estimating, and yet it is possible for a person to have a correct list of all the labor and material and yet be off in his estimate.

The factor of guess enters into all estimating, but the smaller the unit or part is the closer you will come to the right amount. It is a very tedious task to estimate a building, and many get tired when they are half done and begin to lump off the work, and just here is where they fall down and get their bid either too high or too low, or may by chance get it right.—Carpenter and Builder.

A novel type of concrete house construction has recently been perfected by Mr. George M. Graham and applied to a residence at Glencoe, Ill. This building is described in May, 1909, Monthly Bulletin. No. 60, of the Universal Portland Cement Company. The columns and girders are of steel tubing, filled with concrete, and the floors, walls and partitions of concrete laid on wires stretched between the framework members and acting as reinforcement. In erection, the tubular framework is first placed, then the wires which serve as forms on which to lay the concrete. Photographs and more detailed descriptions are in the above named bulletin.

The design of Mr. P. J. Turner, F.R.I.B.A., Montreal, has been accepted for this year's exhibition by the Royal Academy, London, England. Mr. Turner is a well known architect, having his office in the Board of Trade building. He is a special lecturer in the architectural department, McGill University.

During the last week but one in May Winnipeg's building permits totalled over one million dollars.

LEGAL DEPARTMENT

Information for this Department is requested from Architects, Engineers, Contractors and Builders. Send in the particulars of recent cases in which you were interested, giving the main facts tersely.

Collapse of Bridge—Limited Responsibility of Municipality.—The Goodison Thresher Company v. Township of McNab was an appeal by the defendants from the order of a divisional court affirming a judgment of Judge Anglin in favor of plaintiffs for $807.18. The action was brought to recover damages for negligence on the part of the defendants in the maintenance of a bridge which broke down when the plaintiffs were engaged in drawing a traction engine used for threshing purposes over it, letting the engine through to the water and considerably injuring it. The defendants, besides defending, also counterclaimed, claiming damages for the injury to the bridge. Anglin, J., found as facts that the bridge was a good bridge of its class, well constructed and in good repair, and capable of safely carrying all ordinary traffic, but insufficient to bear the engine in question, which, he found, was about seven tons in weight; that no planks had been laid as required by the statute; and that, had the statute been complied with, the effect would have been not merely to protect the surface of the bridge, but to have so added to the sustaining power of the stringers that they would have carried the engine over in safety; in other words, the accident would not have occurred. He held as matter of law that the defendants were bound to provide a bridge sufficient to bear a threshing engine of less than eight tons' weight; that it was not a condition precedent to using the bridge to lay the planks; that the failure to do so did not stand in the way of a recovery; and that, while there had been no negligence on the part of the defendants in the ordinary sense, the plaintiffs were nevertheless entitled to recover by reason of the defendants' failure to comply with statutory duty. The appeal court reversed this decision and found that the plaintiffs were guilty of contributory negligence in not laying the planks. The plaintiffs accordingly failed and were found liable to the defendants under the counterclaim for the damages done to the bridge, which damages were set at $77.80. The appeal was allowed and the action dismissed, both with costs.

Right to Water Supply and Sewer Connection.—The Township of Barton v. the city of Hamilton was an appeal by defendants from judgment of Judge Anglin in favor of plaintiffs, the township corporation, one Barnes, and two other persons, in an action for a declaration of the rights of the plaintiffs in respect of water supply and sewers, and for specific performance and other relief. The judgment of Judge Anglin declared that the city water supply was inadequate for fire purposes, and that defendants could not add to the demands upon it without danger, and could not be compelled to supply residents of Barton with water; that defendants were not entitled to require residents of Barton, as a condition of furnishing them with water, to execute agreements containing provisions as to no opposing annexation of territory with defendants, and as to relinquishing pipes, etc., laid and paid for by them, and so as to sewer accommodation; and declaring that plaintiff Barnes was entitled to sewer connection, etc. The defendants thus succeeded at the trial with regard to water supply, and the plaintiffs as to sewers. Barnes, a resident of Barton, territory not annexed to Hamilton, applied for leave to put in a two-inch service pipe to supply water to residents in Barnesdale place. The city engineer reported against a two-inch pipe and advised that nothing less than a six-inch pipe should be put in. It was claimed by the solicitors for the township that the residents of Barton had the right to make connection with the city sewer, but the defendants did not recede from a position which they had taken requiring Barnes to sign an unfair agreement before giving him leave to connect with this sewer. Subsequently, Barnes made the connection himself and notified the defendants, inviting their inspection and the fixing of a rate. The city wrote Barnes, notifying him that unless a proper agreement, approved of by the city solicitor, were executed forthwith, the defendants would be obliged to cut off the connection. Subsequently he was notified that the council had adopted a report of the committee that the connection should be cut off, and shortly after the connection was cut off. The judgment of the court, in part, was that Barnes was not within his rights in connecting the private sewer, that in doing so he was committing a trespass and the city should not be ordered to restore the connection.

Liability for Wages in Absence of Contract.—Milne v. Ontario Quarries, Limited, was an appeal by defendants from an action in which the plaintiff, a quarry operator, sued the defendants for $483 for wages. The defendants denied the employment of the plaintiff. At the trial judgment was given for plaintiff for $483 and costs. It was proved, despite the absence of a contract, that the plaintiff had been in the service of the company and the case resolved itself to a question of evidence. The plaintiff was hired by the acting manager and was working with the knowledge of the majority of the directors. The appeal was dismissed with costs.

Railway Contractor's Claim.—The action of Messrs. Michael Pigott & Company, railway contractors, of Hamilton, against the Guelph and Koderich Railway Company, a branch of the Canadian Pacific Railway, for $523,574.75, the amount they claim is due to them for the construction of the road, and which occupied the attention of Mr. Justice Britton two weeks, has been adjourned until Sept. 20th next. According to their claim, the plaintiffs, trading under the name of M. A. Pigott & Company, entered in July, 1904, into negotiations to build a railway line between Guelph and Goderich, for the defendants. The work was completed, they state, in August, 1907, at a total cost of $1,117,115. Of this, they have received $593,540, leaving the balance claimed, namely, $523,574, including extra work. They state that the railway company has offered them $100,000 in full of payment, which they refuse. They further state that the railway company's chief engineer refuses to give them a certificate for the completion of the work. The railway company, in its defence, states that the work of construction was not completed within the time limit, nor even in the extended time limit; that all extra work was paid for at the close of each month, and that the work is not yet completed. They state further that the contending parties held a conference, at which both agreed upon a settlement, but that Pigott & Company broke off the negotiations. The company's engineer, thinking the settlement held good, gave the plaintiffs a certificate of completion, which they claim should not have been given. Their counterclaim is for loss owing to breach of contract.

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Desiderata in the Practice of Architecture

Given certain ability as a draughtsman, perhaps no qualification is a better recommendation for the young architect than a proper sense of fitness. Too often the young architect is concerned more that the building be a monument to himself than that it be perfectly adapted to its purpose. Here he commits not only a grave error, but also an injustice to his client, whose funds he is expending, and who rightly expects, first of all, the practical solution of his problem. Too often the young practitioner, much impressed with his college training, his draughting experience in the office of an important firm of a larger city, believes it his first mission to educate the client, rather than to completely familiarize himself with his needs, so as to fit himself thoroughly for the task of solving the problem just as the owner would have it solved. He argues him into carrying out his own personal notions, and dissatisfaction generally results.

To win the client's endorsement and enthusiastic approval, it is absolutely necessary to get into close touch with his requirements, to enter into his spirit, to study carefully his problem and look at it from his point of view, and to assist him in every way in the solving of his practical difficulties. Artistic ability will count for much, but a liberal amount of common sense and a willingness to do all and a little more than is expected of him will do much more in the building up of the successful practice.

The main desideratum is to secure the client's confidence. It is so in every walk of life. When once a man places confidence in another he lays egotism aside and considers a thing from the other's point of view. Of course it is not always easy to establish oneself in a man's confidence. It all depends upon whether one possesses that ready power of appreciating and saying and doing what is the right thing under the particular circumstances. In a word, it depends upon tact.

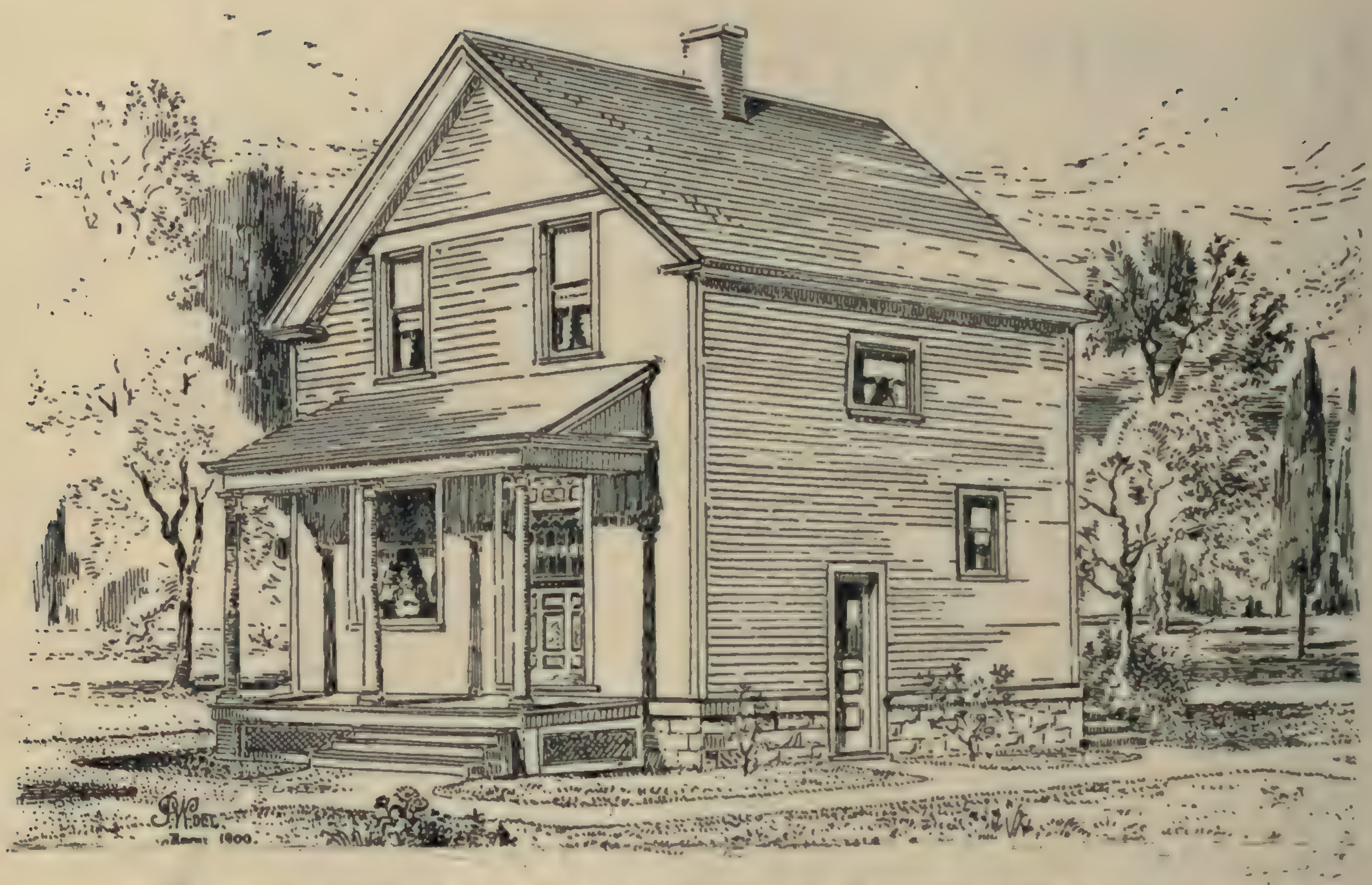
There are other essentials in the practice of architecture. Proper technical training and a fair share of artistic ability are among the first of these that come to mind; then culture and affability demand a high place, but primarily and fundamentally, the architect must have tact and that sense of fitness. He must always remember that it is of even greater importance to the client that the plan meet every practical requirement and that every convenience for the carrying on of his work or his business has been provided, than that purity of style has been preserved or a certain individuality developed.

Crop Reports from the West

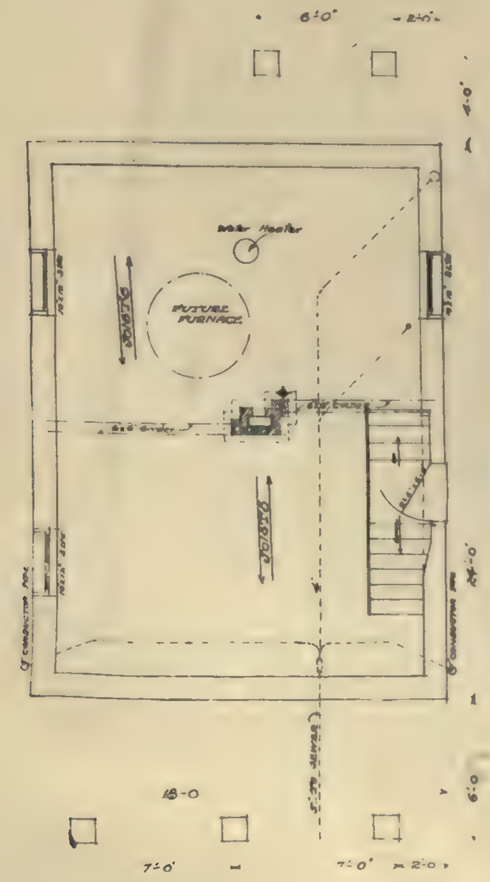
From the various wheat centres of the West there have been received encouraging crop reports. Wheat seeding was a couple of weeks later than in 1908, but in conjunction with this fact it should be remembered that it was more than a week earlier than in 1907. Some localities report an increase of from thirty to fifty per cent. in the acreage of wheat sown, while others, owing to the late season, have to record a decrease. Generally speaking, however, the outlook is surpassing expectations. In most districts there has been just the amount of moisture required for the germination of the seed. This circumstance, together with the assurance of warm weather next month, should allay all anxiety in regard to the late season. Experienced farmers, those who have grown up with the country, while they complain of the backwardness of the season, declare that with good weather to bring the crops along, the prospects are exceedingly bright.

Building Prospects

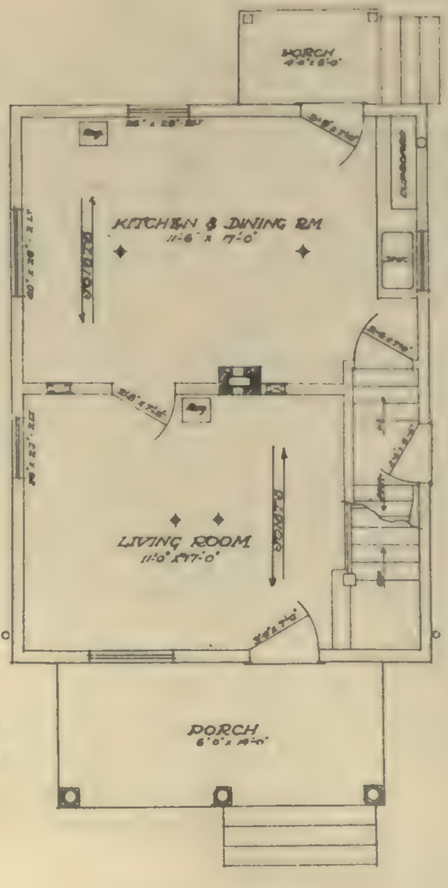
Building prospects, scarcely, if ever, looked more promising at this period of the year, than they do now. Preparations for new work are being made in all the large factories, and the catalogue men are being flooded with inquiries, and orders in all their departments. "Do it now," is a good motto at the present juncture when building is intended to be done this season. Large quantities of manufactured building materials were on hand when the new year came in, but large and frequent orders have been, and are, making big inroads into the stocks, and it looks as though every wheel in the country would be running before the season is over. The tendency of prices is upwards, and goods that are now reasonable, or in some cases low in price, will be much higher before long. As the season advances, business men are becoming more and more confident. "Confidence" should be the slogan of all who would see the present year one of record prosperity. The builder never before had a stronger argument with which to tackle a prospect.



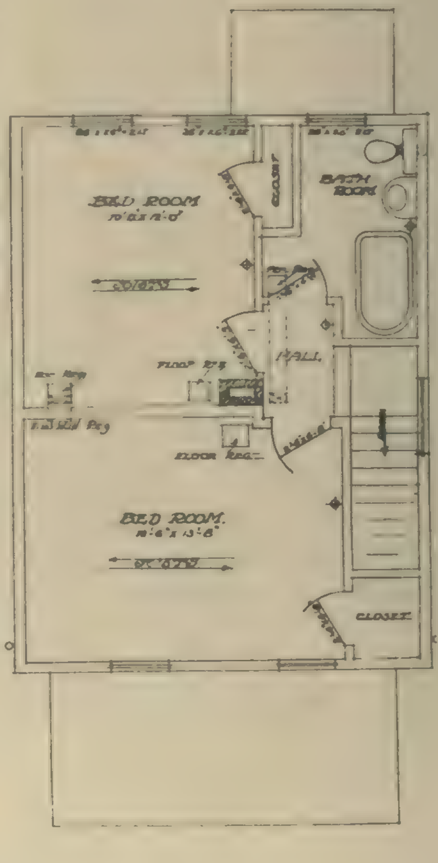
Prize Winning Designing for $1,000 house in the Competition of the Rochester Chamber of Commerce.



Cellar Plan



Ground Floor Plan

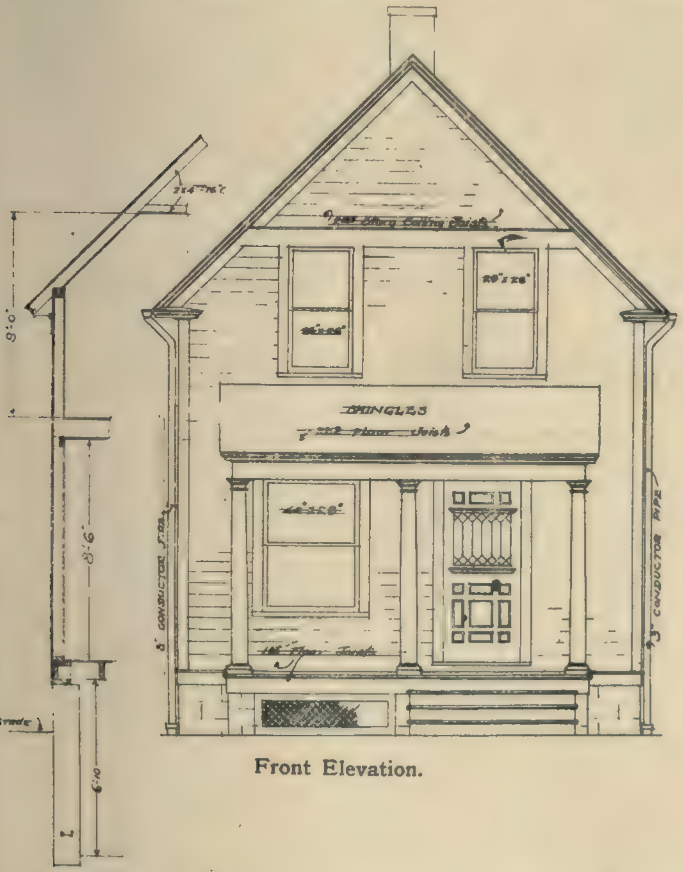


First Floor Plan

A Good Design for a Dwelling of Low Cost

Awarded First Prize in Recent Rochester Competition—Convenience—Economy—Attractiveness

The Rochester Chamber of Commerce recently conducted a competition for house designs of three classes Prizes were given for the best suggestion for a $1,000 house, a $1,250 house, and a $1,500 house. The successful design for the house planned to cost $1,000 is reproduced herewith. It will be seen that the total cost according to the estimates is $1,632.60. In awarding the prize the jury were not unfavorably impressed by this circumstance, the chairman remarking that it was a common fault on the part of contesting architects to estimate the cost too low. Prospective builders should not have much difficulty in adjusting the figures contained in the estimate to their own locality. The house is necessarily simple, yet attractive, in design, and for those who require houses of low cost the plan is convenient and economical.



Front Elevation.

Excavating and Masonry.

90 yards excavating at 25c.	$ 22.50
410 cubic feet cement block wall at 25c.	102.50
34 lineal feet chimney at $1	34.00
48 yards cement cellar floor at 50c.	24.00
Total excavating and masonry	$ 183.00

Lumber Bill.

	Feet.
6 2x2x16 for sills	126
6 2x6x16 for sills	96
6 2x4x16 for sills	66
1 6x6x18 for girder	54
15 2x8x12 for first floor joists	240
7 2x8x14 for first floor joists	133
30 2x8x12 for second floor joists	480
20 2x4x14 for collar beams	180
40 2x4x14 for rafters	360
50 2x4x14 for outside studding	450
36 2x4x18 for outside studding	432
20 2x4x14 for gable studding	180
14 2x4x18 for first storey partitions	168
30 2x4x16 for second storey partitions	330
20 2x4x16 for plates	220
7 2x6x14 for porch joists	98
8 2x4x16 for porch ceiling joists	88
10 2x4x18 for porch rafters	120
2 1x6x18-foot ribbon boards	18
20 1x6x12-foot braces	120
18 1x4x12-foot bridging	72
10 1x3x18-foot backing	45
3 2x6x12-foot rear porch	36
8 2x4x16-foot rear porch	88
Total feet dimension	4,200

4,200 feet No. 1 Y. P. dimension lumber at $27	$ 113.40
1,600 feet ⅞x6-inch O.G. siding at $35	56.00
300 lbs. 2-ply card felt, at 2½c.	7.00
900 ft. No. 2, 8-inch Y.P. sheathing at $27	24.30
8 M. clear R. C. shingles at $4	32.00
576 feet 2¼ clear Y.P. flooring for first storey floor at $52	28.95
540 feet 3¼ face Star Y.P. flooring for second storey. floor at $36 ....3.	19.44
140 feet clear fir flooring 12 feet, at $60	8.40
140 feet ⅝x4x12 feet No. 1 Y.P. ceiling for porches at $33	4.62
300 sq. ft. 1x8x16 clear fir or cypress finish cornice at $50	15.00
80 sq. ft. 1x4x16-foot clear fir or cypress finish at $50	4.00
140 sq. ft. 1x10x16-foot clear fir or cypress finish at $50	7.00
60 sq. ft. 1⅛x8x14-foot clear fir or cypress finish at $50	3.00
30 sq. ft. 1⅛x12x14-foot clear fir finish at $50	1.50
24 sq. ft. 1⅛x12x12-foot clear fir finish at $50	1.20
Total lumber bill	$ 325.81

Mill Work.

3 porch columns, 6x1x7 feet 6 inches at $2.50	$ 7.50
300 lineal feet porch lattice at 50c.	1.50
260 lineal feet 4-inch crown moulds at 2c.	5.20
260 lineal feet 2-inch bed mould at 1c.	2.60
100 lineal feet ⅞-inch quarter-round at ½c.	.40
60 lineal feet ⅞-inch cove mould at ½c.	.30
3 cellar window frames, 8x12, 3-lt., at $1.75	5.25
3 cellar sash, 8x12, 3-lt., 1⅜, at $1	3.00
1 front door frame, 3 feet 0 inches by 7 feet 0 inches	2.50
1 rear door frame, 2 feet 8 inches by 7 feet 0 inches	2.25
1 side door frame, 2 feet 6 inches by 6 feet 6 inches	2.25
2 window frames, 40x28, 2 lt., at $2.40	4.80
2 window frames, 26x28, 2-lt., at $2.25	4.50
1 window frame, 26x16, 2-lt.,	2.25
1 sash frame, 36x24, 1-lt.	1 75
4 window frames, 26x26, 2-lt., at $2.25	9.00
1 window frame, 26x20, 2-lt.	2.25
2 windows, 40x28, 2-lt., 1⅜ D.S., at $2.50	5.00
2 windows, 26x28, 2-lt., 1⅜ D.S., at $2	4.00
1 window, 26x16, 2-lt., 1⅜ S.S.	1.50
1 window, 36x24, 2-lt., 1⅜ D.S.	2.25
4 windows, 26x26, 2-lt., 1⅜ S.S., at $1.75	7.00
1 window, 26x20, 2-lt., 1⅜ S.S.	1.50
1 set door jambs, 2 feet 8 inches by 7 feet 0 inches 2	.75
1 set door jambs, 2 feet 6 inches by 7 feet 0 inches ...2	.75

13 set door jambs, 2 feet 6 inches by 6 feet 8 inches, at 70c.	2.10
2 set door jambs, 2 feet 4 inches by 6 feet 8 inches, at 70c.	1.40
1 front door, 3 feet by 7 feet, 1¾	18.00
1 rear outside door, 2 feet 8 inches by 7 feet, 1¾	5.00
1 side door, 2 feet 6 inches by 6 feet 6 inches, 1¾	3.50
1 door, 2 feet 8 inches by 7 feet, 1⅜	3.00
1 door, 2 feet 6 inches by 7 feet, 1⅜	3.00
3 doors, 2 feet 8 inches by 6 feet 8 inches, 1⅜, at $2.50	7.50
2 doors, 2 feet 4 inches by 6 feet 8 inches, 1⅜, at $2.40	4.80
34 plinth blocks, at 4c.	1.36
12 pieies casing, 7-foot, 84 feet, at 2c.	1.68
22 pieces casing, 6-foot, 132 feet, at 2c.	2.64
22 pieces casing, 5-foot 3-inch, 116 feet, at 2c.	2.32
116 feet head casing, 12-foot length, at 2c.	2.32
116 feet cap mould at 2c.	2.32
116 feet fillet at ½c.	.58
48 feet Win. stool at 2c.	.96
48 feet apron at 2c.	.96
160 feet Win. stop, 14 feet., at 1c.	1.60
126 feet door stop, 14-foot, at 1¼c.	1.57
274 feet base at 3c	8.22
274 feet floor mould at ½c.	1.37
204 feet picture mould at 1½c.	3.06
3 thresholds	.30
Main stairs	48.00
Cellar stairs	15.00
Total mill work	$ 223.71

Carpenter Work.

4⅓ squares framing, first floor, at $1	4.33
4⅓ squares second floor, at $1	4.33
3⅓ squares second storey ceiling, at 60c	2.00
12 squares framing, outside wall, at $1	12.00
12 squares siding, at $1.20	14.40
8 squares framing roofs, at $1	8.00
8 squares shingling, at $1.75	14.00
8¾ squares laying pine floors, at $1.25	10.94
1 square porch floor framing	1.50
1 square laying floor	1.50
1 square ceiling	1.50
170 lineal feet main cornice, at 11c.	18.70
68 lineal feet porch cornice, at 15c.	10.20
70 lineal feet outside base, at 5c.	3.50
7 squares setting partitions, at 60c.	4.20
Setting and finishing 3 cellar windows at $1	3.00
Setting frames and finishing 11 windows at $1.50	16.50
Setting frame and finishing front door	4.00
Setting frame and finishing 2 outside doors, at $3.25	6.50
Setting jambs and finishing 7 doors at $2.50	17.50
274 feet Y. P. base, at 4c.	10.96
Putting up main stairs	23.00
Cellar stairs	6.00
204 feet picture mould at 1c.	2.04
Strips and shelves in 2 closets at $1.50	3.00
Incidentals, 5 per cent.	10.32
Total	$ 216.74

Summary.

Excavating and masonry	$ 183.00
Lumber	325.81
Mill work	223.71
Carpenter labor	216.74
Hardware and tinwork	48.00
Plumbing	250.00
Plastering, 380 yards at 27c.	97.60
Painting	80.00
Furnace	120.00
Incidentals, 5 per cent.	77.74
Total estimate	$1,632.60

The Architectural Possibilities of Brick

Primarily, or perhaps we should say fundamentally, the brick manufacturer is interested in his material as a purely commercial proposition. He has invested a certain amount in a plant and it is up to him to keep that plant at its full capacity in order to get therefrom the greatest return upon his investment. We, the architects, are interested in brick as simply a unit, one of many, used in the expression of our ideas, in the materialization of our designs. In those two basic viewpoints our interests are dissimilar, but immediately thereafter they draw closer together. We want the very best thing we can get and it is to the manufacturer's interest to come as near supplying that demand as he possibly can. Some would have us believe that there is inborn antagonism there, a sort of distrust of each other, the one ever criticizing and demanding something better and the other yielding just as little as he possibly can. This is the wrong view. The closer the architect and the manufacturer get together and train themselves to think with each other, so to speak, the better it is for them both and for the buildings, the art, that yields them both not only their bread but the opportunity to develop, to attain eminence.

There were makers of brick at a very remote period in the history of man, perhaps even before there was any need for architects. The monuments of stone and of marble have decayed, the story they tell us in their hieroglyphics and pictured carvings is well-nigh obliterated, but the work of the potter, the maker of tile and of brick, has been preserved to us in almost perfect condition. The buildings may have crumbled, on account of the disintegration of the mortar used in the joints of such brickwork, but the clay-work itself is unworn, intact. See what has been unearthed at Babylon, at Nineveh and at Thebes, and look at the splendid work in tile and in brick still standing in all its pristine perfection in Persia, Assyria, India, and in the early Christian examples of architecture at Byzantium and the other Roman dependencies. Surely we have precedent enough not only as to how to make brick that will last, but how we may put those brick together to form architectural masterpieces.

In ancient times there were rather sharply drawn lines in the use of materials. Geography and geology had much to do with the establishment of these demarcations. In places where stone was found and was easily quarried, stone, of course, was the most used material; in the neighborhood of great forests wood came easiest to the hand of man, to be fashioned into habitations and shelters, and then in regions in which neither timber nor stone was plentiful, man quickly learned to make for himself a building material from the clay of the soil, moulding it with his hands and letting the sun harden it into permanent form or burning it with the straw and refuse of his cultivated fields.

In our own time the history of brick has been most interesting. Its career may be said to have been checked, but it has succeeded in making a place for itself that is unassailable and most deserving of respect. At first in colonial times it was a luxury and brought here from the mother country at great cost. Then each brick was as precious as a drop of its owner's blood and as carefully guarded. The theft of brick was a very serious offence indeed, and punishable with the severest penalty. Then our fathers began to make brick themselves, rather a crude affair, but, laid up with a wide joint, the effect was quite artistic. Later, for awhile, everything had to be of stone. A man must indeed be of common clay if he abided in but a brick house. Stone and marble were the proper materials; and if he could not afford them, why he stuccoed his brick and jointed it up in beautiful ashlar, or he built of wood. It was fashioned to imitate stone with joints, however, and everything was most painfully copied.

In our own times brick was revived; there was a species of Renaissance, but it was only used for secondary buildings, as we might call them, the really monumental affairs having to be of granite, stone or marble. Those secondary or commercial buildings, nevertheless, were of more or less importance, and though we could not afford to make them of marble, stone or granite, we craved something better than ordinary brick and so pressed brick came into vogue. Kilns were carefully picked over and each building presented a most uniform appearance. The brick were all of an exact size with the narrowest imaginable joint, and of precisely the same shade in color—you can still get exactly the same effect by whitewashing or kalsomining a wall surface. It was distressingly beautiful. Some thought that galvanized iron and similar ornamentation was not quite the right thing, and so the brickwork was ornamented per se. Bands of black brick were introduced, little spots of other color were injected, and dog-tooth effects were everywhere. Then we had moulded brick, but the desire was always to get something that looked as nearly like stone as possible. We seemed to realize and properly appreciate that brick was only used as a substitute, something cheaper than what we would like to use, and it was for us to make it look as much like the real thing as we could. We always apologized for a brick building.

It has only been within the last ten years that brick has really come into its own and taken its proper place among the available media architectural. Our architects have found that granite, stone and marble buildings, where at all exposed to fire, have been cruelly spalled and damaged. They realize that in our highly combustible cities nearly every building they erect is exposed to a greater or lesser fire hazard on account of its neighbors, and they have found that brick best withstands fire. It has also dawned upon them that much expression can be obtained with brick, and latterly they have used the material from preference, selecting it regardless of price, instead of granite, marble or stone. The old notion of uniformity of color and great exactness as to shape has given way to the saner adaptation of rougher forms and varying tints. It is surprising to note the beautiful effects that can be obtained in brickwork to-day. In a stone building, elaboration of ornament and panelling and mouldings are necessary, or the mass of a building becomes brutally heavy and uninteresting. An architect generally fights shy of much plain wall surface in stone. In brickwork just as great an architectural variation can be obtained. There can be produced seeming elaboration, plays of light and shadow, and at infinitely less cost than the carvings and mouldings in the stonework. At the same time, also, a plain wall surface is sought for by the artistic designer. If there is no occasion or reason for his diversifying that wall in the flat by diaper work and artistic joinings, the crude, plain wall surface itself is most effective and prettier far than an equal surface of any other building medium. There are finer gradations of tint in it than in any other material, save possibly some of the very expensive foreign marbles, and these in large masses weary the eye.

Usually it has been the architect who created the demand for certain kinds of forms of material, but in the case of artistic brick the manufacturers have taken the initiative and produced the material first and offered it to the architect. This has been much to the latter's pleasant surprise and it has taxed him to supply that brick in one-half of its possibilities of artistic effect.

There is a rather unfortunate tendency toward ultra-specialization in materials. The concrete enthusiast wants his house entirely of concrete. If he could only get it transparent enough he would have it in his windows. The glass people have had in mind a building entirely of glass, with fittings and furnishings of glass, everything of glass whether it would best suit the purpose or not, and so it goes. I believe in a judicious combination of materials, each one in the place for which it is best suited, therefore I am not clamoring for a brick roof, brick down-spouts and brick window sash; but I do believe that there are yet endless, almost unthought of possibilities in brick construction that for the best interests of architecture, let alone the brick manufacturer, we should seek to discover, to develop, or to protect.—F. W. Fitzpatrick, in "Brick."

House Built in a Day

The novel sight of seeing a house built in a day greeted the eyes of St. Louis citizens not long ago. It was due to the whim of a bride who desired to have the structure completed at once. Though at half past six in the morning not a sign of any material was on the ground, an hour later several loads of lumber and other material had arrived, together with the contractor and sixty carpenters.

The contractor's hardest work, it was said, was in keeping his men busy, but he managed to do this, and not a man was in the wrong place nor performed more than necessary labor. At seven o'clock in the evening the painting and plastering were finished and the floors laid. The windows and doors were also installed and other work on the edifice completed.

The house has living and dining rooms, kitchen, bedrooms and is equipped with modern conveniences. It is said to be quite a prepossessing structure.

Architectural Students' Competition

The competition inaugurated by the "Contract Record" for architectural students is attracting much interest and the indications are that many designs will be entered. With this prospect in view it is assured that the competition will be keen and will bring out much good work. Enquiries have been received regarding the necessity for adhering strictly to the measurements of the rooms as given in the announcement. These measurements were more for a guide than for a strict regulation. Their proportions were decided upon in the belief that they would provide the most attractive rooms. So long, however, as the number of square feet in the rooms is adhered to, as given in the announcement, the designs will be eligible. The study is to be situated on the first floor. In the announcement of the competition this point was not made clear, and in order to avoid misapprehension, intending competitors are advised of this condition.

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Sewage Disposal by Means of Septic Tanks

The correct method of the final disposal of sewage from dwellings is a most important question, and this branch of engineering has made wonderful advancement within the past twenty years. There can be no doubt that the use of the cesspool is a constant source of danger from contamination of the water supply, even though this contamination may not occur immediately, but after many years.

Among the various methods utilized by the sanitary engineer for the final disposal of sewage, the septic tank system plays a prominent part.

The theory of this method of sewage is as follows:

The sewage from the house enters a receiving basin where it has a period of rest of about three days. During this time fermentation takes place, breaking up the albuminoid bodies which throw off various gases and allowing at the same time the precipitation of the heavy inorganic bodies, which settle to the bottom. From the receiving basin the sewage flows to the discharging basin. Here fermentation is carried further, with a final slight precipitation. When the sewage in the discharging basin reaches a certain determined height, the seal of a siphon is broken and the entire contents are delivered to a disposal field through a 4-inch main distributor and from this it flows into a number of 3-inch lateral drainage tile branches. From these branches the sewage enters trenches through the open joints of the pipes, where it comes in contact with the oxygen, held in the interstices of the broken stone, which attacks the sewage, throwing off hydrogen, nitrogen and other gases. The drainage lines being laid but 12 inches deep, the roots of the growing vegetation absorb the nitrogen, which accounts for the rank growth over the field.

The question of sewage disposal by this method depends upon the character of the soil of the disposal field, the distance from the house, the number of persons living in the house and many other points which can only be decided by the engineer.

In fig. 1 is shown details of a receiving and discharg-

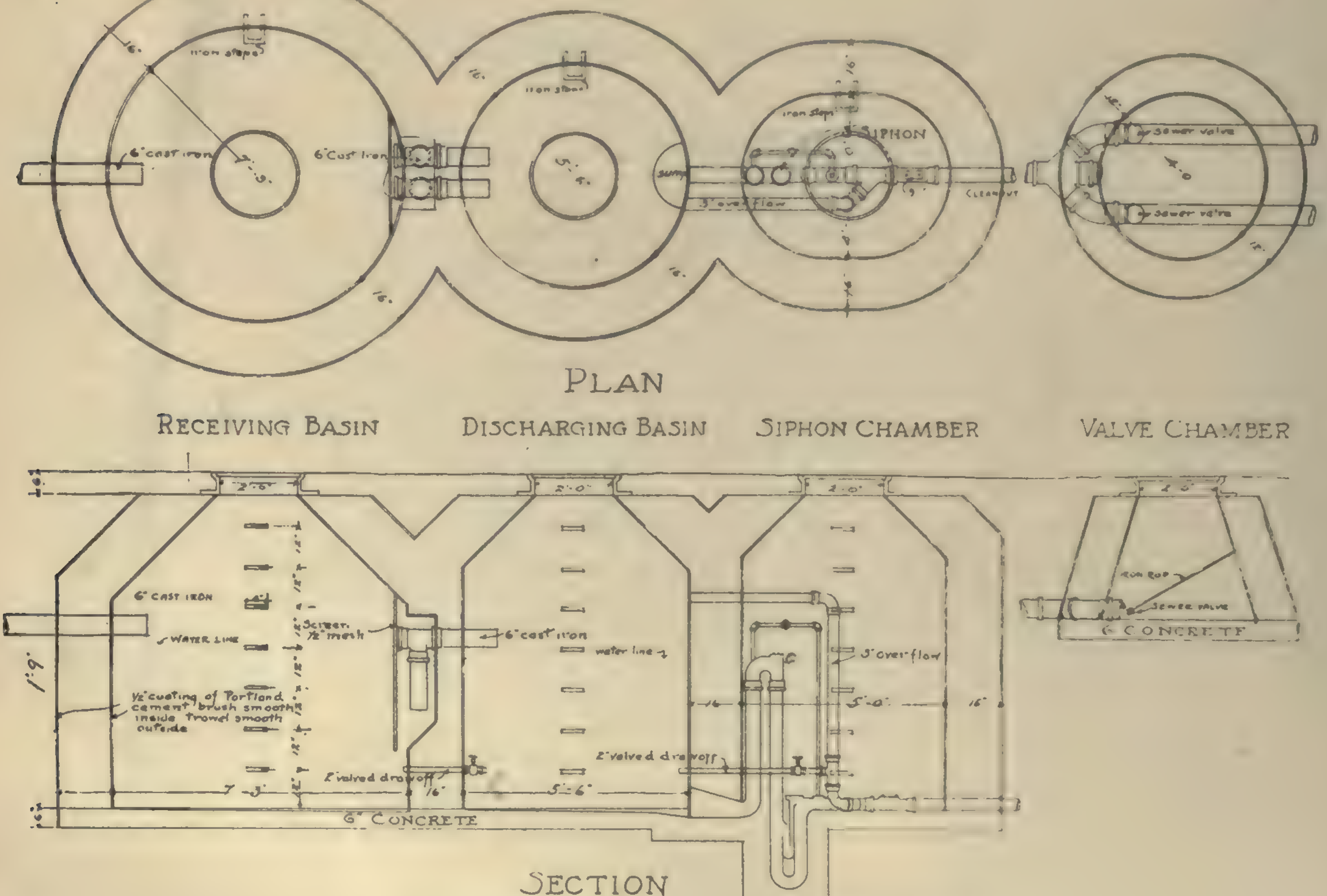


Fig 1.—Details of Receiving and Discharging Basins.

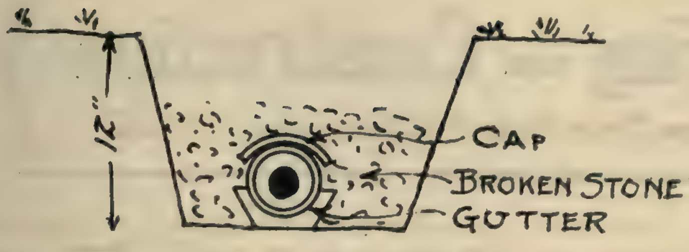


Fig. 2.—3-inch Tile in Trench.

ing basin, with the adjoining siphon basin and its siphon as usually installed.

A good method of constructing the basins is of field stone laid in Portland cement. The bottoms of the basins should be composed of concrete laid to drain to one point. The basins should also be so arranged that they can be drawn off one into the other.

The mouth of the siphon is set in a small sump, built into the bottom of the discharging basin, so that when the siphon operates the entire contents of this basin are carried off.

In the siphon basin there should also be provided an overflow and valved draw-off and a clean-out.

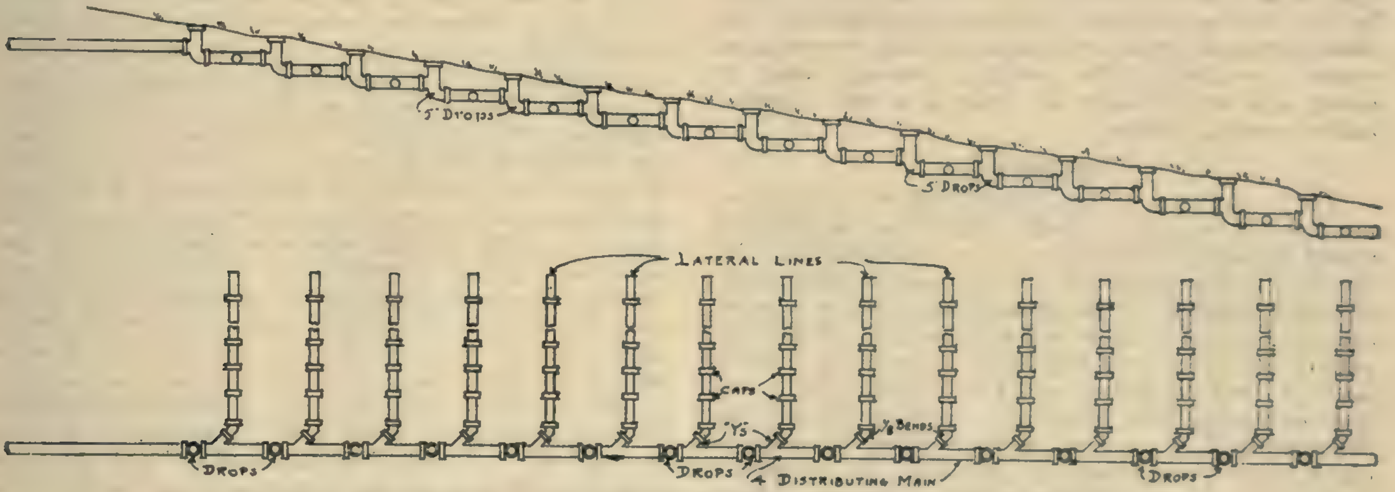


Fig. 3.—Detail of Disposal Fields, showing Distribution Mains, "Y" Branches, Lateral Lines and Drops.

For the pipe work in the basins, extra heavy tar-coated cast iron pipe may be employed.

By the action of the siphon the sewage from the discharging basin is led into a 4-inch vitrified main discharge pipe, which terminates in the main distributor.

The disposal field should not be located too near the house, and should consist of 3-inch drain tile, laid about 10 or 12 inches below the surface of the ground, as shown in fig. 2.

The tile is surrounded with about six inches of broken field stone. The tiles should be laid about a quarter of an inch apart and the lateral lines should not exceed 90 feet in length.

The manner of disposing of the sewage by means of special "drops" is shown in fig. 3. By the use of these

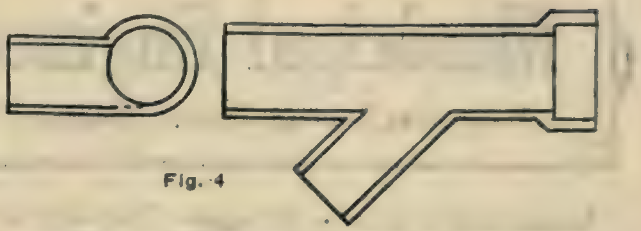


Fig. 4

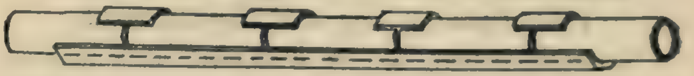


Fig. 5. 3-inch Drainage Tile.

"drops" the sewage flows with but the slightest fall. The drops are of vitrified pipe, made in one piece, and have hub and spigot ends. Special drainage branches are placed between the drops. These branches are also of vitrified pipe and are made "right" and "left," as the invert of the 3-inch branch is on the same level as the invert of the pipe itself.

A detail of these special Y branches is shown in fig. 4.

From the end of the 3-inch drainage Y branches is laid the 3-inch drainage tile, as shown in fig. 5. This tile is the ordinary absorbent drain tile, is not vitrified, has no hub or spigot, and comes in 1-foot lengths. It is laid on guttters of the same material, which act as a bed upon which the tile rests, and which allows the tile to be laid with much more care than if it were simply laid upon the ground. The gutters also serve to hold the tile in place, when the tile trench is being back filled, and act as a permanent bed, so that the tiles at any future time may be removed for cleaning and relaid in their original position and grade. Over the point where two tiles meet is placed a cap of the same material. This is to prevent the entrance of earth, stones, etc., into the tile when the trench is refilled.—Engineering Review.

It is interesting to note that the acoustic properties of a hall improve with the age of the building. Artificial illumination, and light rays in general, seem to have an effect on the acoustics. The Paris "Gaulois" published an account in which it was stated that the former director of the Paris Musical Academy, Mons. Gailhard, had shown that the vibrations of a tuning fork, which could be readily heard in the dark in a certain hall, could not be distinguished when the room was lighted. That the architects of old were fully acquainted with the conditions governing good acoustics, is shown by the fact that in their immense theatre buildings, for instance that at Tauromenium, which seated 30,000 persons, all could hear the performers' voices. If in the much smaller auditoriums of the present day science will permit this also to be said with any degree of truth, remains to be seen; but in the meantime it will probably be a matter of great doubt.

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

Reinforced Concrete Bridges—The Cost of their Construction and Maintenance

Concrete—either plain or reinforced—as a material of bridge construction possesses the merit of being adaptable as a substitute, within limits, for both stone masonry and steel framework, and of combining the qualities of both, said E. P. Goodrich, consulting engineer, in a recent address before the National Association of Cement Users. It is equal to and may be more economical than stone masonry for abutments, piers, retaining walls, coping and parapets, and in many cases makes an arch available with its manifold advantages where a stone or brick arch would be impracticable.

It is found also to be an advantageous substitute in the shape of jack arches or reinforced slabs for steel floor troughs and buckled floor plates on steel bridges, whereby we have a composite structure—not strictly reinforced concrete but a combination of steel members and concrete members. The resulting product, when the design and workmanship are good, is a rigid, enduring and economical bridge.

Limitations.

The limitations of the proper and economical employment of concrete in bridge structures can hardly be stated, certainly not with any degree of definiteness. Conservative designers are not in entire accord with respect to either methods of use or allowable working stresses, and comparisons of value and cost between all steel and part of all concrete or reinforced concrete can only be made on finished designs and for the same site. Even then estimators may not agree as to which will cost the most, and, if we may judge by the wide range of prices quoted in contractors' proposals, the contractors themselves can not more accurately determine relative values in cost. To the beginner or purchaser the cost of a bridge is the contract price—the cost, to the builder should of course be less.

The actual cost of a job to the builder is usually not published and is rarely divulged to even the engineer, and an engineer's basis of estimate must be the bids and contract prices previously obtained.

Any list of costs will exhibit great variation in the figures for structures of the same class and similar dimensions and conditions, and when the most infinite variety of conditions and combinations of varieties are considered, the difficulty of conveying useful intelligence on the subject is apparent.

The length of span, width, height, depth and character of foundations, length and shape of wings, loads to be carried, amount of filling or grading, railing or parapet, character of the concrete—plain or reinforced or rubble, market prices of materials, and accessibility of the work to railroad service, all affect the question of cost.

Impracticable to Select Unit of Measure.

It is therefore impracticable to select any unit of measure of a bridge and use it as a reliable basis for estimating cost. In a table covering eighteen concrete arch bridges recently built in Philadelphia the concrete price agreed upon the span area—the clear span by the width—varies from three dollars and eleven cents to nine dollars and seventy-four cents per square foot, and it varies from one dollar and seventy-three cents to seven dollars and thirty-nine cents per square foot of area occupied by the ground plan to ends of wings, the latter extremes being not on the same bridges as the other two. The average of the lot was $6.25 per square foot of span area and $3.50 per square foot over all, most of them being single span bridges with long wings, and all being highway bridges designed to carry loads of forty tons on two axles 20 feet apart. All have ornamental concrete balustrades and washed granolithic surfaces and paved decks, with electrical conduits and manholes, and water pipe and sewer wellholes, and some have pretty deep foundations. If the whole contract price be set against the yardage of the concrete in the structure the unit costs vary from $6.50 to $11.25 per cubic yard, averaging $9.75.

It is found that in the circumstances under which the bridges referred to were built, steel plate girder bridges will cost more than concrete arches. Several opportunities for fair comparison have made this clear, as great a difference as 25 per cent. of the higher being indicated. This saving is in the first cost, and if we add the capitalized cost of proper maintenance of the steel structure—which seems to be a fair element in the comparison—the advantage of the concrete arch appears far greater. A real money value also attaches to the superior beauty and attractiveness of a decorative arch structure in almost any locality—a question that almost always is the subject of consideration and decision in designing public work, for it must be determined what amount is proper to be expended for mere appearance.

The composite bridges — steel structural frame with concrete envelope — share with the arches, or at least promise to, the quality of permanence, and therefore exemption from expensive maintenance charges. As between the ordinary steel plate girder bridge with buckled plate floor for permanent paving, and the composite type, the lower first cost is with the composite if the spans be short, for the greater dead weight of the concrete floor tells on the long main girders whose section is usually determined by the general load, dead plus distributed live, while the individual floor members are determined by the heavy concentrated live load. The embedment of the floor stringers, or joists, in the concrete jack-arch construction effects a saving of steel, first by dispensing with floor plates, and second by permitting lighter stringers to be used, for the jack arches distribute a concentrated load over any three beams, where with a buckled plate floor each beam must carry the whole concentration, and besides, the embedment of a beam in concrete increases its carrying capacity about one-third.

Where it is the practice to protect steel bridges over railroad locomotive service by means of a wooden ceiling under the whole underside of the bridge, the economy of the concrete floor is more marked because such a ceiling costs about 25 cents per square foot and lasts only a few years. This first cost alone will pay for tbout one cubic foot of concrete in the floor, and only about 15 to 18 inches average thickness of floor concrete is required. As steel floor plates with their riveting cost from 50 to 75 cents per square foot, the concrete floor appears to cost only about one-half as much as an all-steel floor, besides saving materially in the stringers. Floor beams may or may not be required to be heavier to carry the concrete floor. If they are not very long, the value of the concrete embedment may make up for the increased dead load stress. The main girders will need to be heavier than for the steel floor, because little or no value can safely be assumed to be derived from the concrete casing.

Cost of Concrete Bridge Work.

The cost of concrete bridge work of almost all classes can be materially reduced, and the service value of the concrete at the same time increased, by the embedment in the concrete of suitable hard stone, in size from that of spalls to the largest that can be conveniently handled or that will be comfortably accommodated in the compass of the forms. The economy of this construction depends upon the cost and shape of the embedded stone and the amount embedded without too much labor expended and without restricting the output of the concrete plant. It has been found that the percentage of the volume of the finished work that such stone amounts to varies from 25 to 40, or from 33 to 66 per cent. of the volume of the mixer concrete, according to the shape of the stone and the care taken in placing it.

The cost of handling and placing this approximate third is probably about equal to that of mixing and handling and placing an equal volume of concrete. The saving therefore should be the difference between the delivered cost of the concrete materials and that of the stone. If the stone delivered costs one-half as much as the cement and sand and gravel that when mixed equals it in volume, and if the embedded stone amounts to only one-third of the finished work, then the cost per cubic yard of the finished work is eighty per cent. of that of plain concrete.

A Straight Talk to Contractors

A contractor should be able to know, within reasonable limits, how much a certain amount of work will consume, in actual time and labor, writes Warfield Webb in the "National Builder." He must understand just how much material will be required for the contract, and be able to purchase the same to the best advantage.

Experience is a practical teacher, but, being costly, it is better to learn all possible without it. What a builder learns from experience is dearly paid for. If he blunders, it may be the means of making him lose the contract and others besides, and it may be so costly that he will be many days in recovering from the effects of the same. Forethought, then, is the primary lesson to learn in taking contracts for yourself.

When a contractor has fully mastered the plans of a structure he must be in a position to order the stock as required, being careful to keep the proper amounts, and the proper commodities in mind at all times. He should figure on the cost of the excavations; on the cost of the foundations and the primary work, as every moment's time is of value when he has men employed by the hour or day, and he must see that his men are not handicapped in this way from a lack of sufficient material to keep them busy. He must see that they get to the building on time and that they remain there until the hour for quitting. I have noted instances where the men did not appear any too anxious to come early or to work late, and that they did not exert themselves then to any marked degree.

An error in figuring the amount of time or material is always costly, and more than that it creates delays and disorders that cost money. The contractor must be the "boss" of the job and allow no one else to give instructions about the work. Others may be older in years and experience, but they should be made to understand that you are fully capable of carrying out your own plans intelligently. If you are not, they will soon find it out, and there will be further disagreeable conditions to contend with.

The quality of material should be carefully noted. Inferior stock and careless workmanship are things not calculated to improve the general tone of the work. In ordering material see that you get what is called for at the proper price, and see also that the same is delivered to you on time. Your own supervision of the work is the best evidence that you are vitally interested, and one that will do much to get you other work. If you are not there much of your time there will be occasions when your presence will be badly needed and when the lack of it will be costly.

It is the details that go so far toward success in this day of earnest competition. Noting these is naturally irksome at times, but they are essential, and the man who does not see the necessity of looking after the smaller things will be sure to overlook some of the larger ones, and that means sure and certain failure. First have the knowledge yourself, and then you can impart the same to those under you.

As the work progresses you should be able to see what will be required next, and thus keeping in advance of your men you will not permit anything to drag that will cause delay. At the end of each day you should see just what headway has been made, and thus be in a position to begin the following day's labor with a correct idea of what is to be done. In this way you are not likely to make serious errors, and where there are no serious accidents the work will go forward in a satisfactory manner all round.

Many people are a trifle cranky about the erection of a building, and some of them are inclined to believe that they know more than either architect or builder, and these things make the work at times harder. Stick to your contract to the letter, and if there are any alterations that require more than ordinary time and labor, see that they are paid for, otherwise you will lose money. Some people are unreasonable in that they will expect too much from a builder, and that they will not give the time that much of the labor entails. Most of us want things in a hurry these days, and the builder is one man who must work hurriedly, and at the same time slowly. He must do his work well, but he must not waste time. Every hour means much for him, and more for the men who are working under him.

To the builder who is just starting out for himself. there are lessons to be learned that will try his patience, but the man who cannot gain by each new problem is not the man who will conquer in the end. A full understanding of the things that are for him to know should be borne in mind. and his eyes and ears should be ever ready to get an idea that will be helpful in bettering the labor that he has set about to do. and thus increase his possibilities and make sure his life work.

Cement manufacturers should not forget to grind their material before burning, if they use modern continuous kilns. The finer the grinding at this stage the better the cement later.

The Construction of Modern Sanitary Dwellings

Defects to be Avoided and Principles to be followed.—Practical Suggestions by Dr. Elzear Pelletier

In a paper entitled "Our Unhealthy Dwellings," written by Dr. Elzear Pelletier, secretary of the Board of Health of the Province of Quebec, and published in pamphlet form, many valuable suggestions are made with reference to the proper construction and planning of dwellings, from the point of view of the health of the inmates. Dr. Pelletier writes in part as follows:

As the population of our cities increases, the dwellings are huddled together, without any care given to their orientation in order to secure sunshine and light for the apartments, and without reserving enough free space to allow the air to circulate around the dwellings.

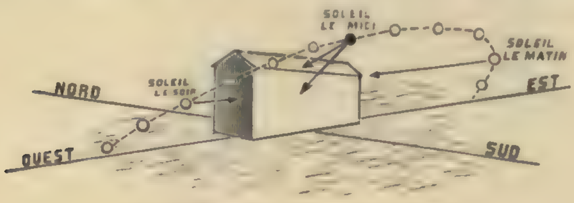


Fig. 1.—Defective Orientatio (Trelat).

The height of the buildings constructed is out of proportion with the width of the streets, which will look, in time, like mere lanes; wings are built precisely in the places where they will intercept the sun-rays most directly; some so-called improved dwellings are constructed, in which the half of the rooms are lighted from closed yards, which consequently only contain stagnant air, moreover some of these yards are only wells, styled light-wells, but where the sun can never penetrate; rooms are made without any window whatever; lastly, dwellings healthy until now are transformed into absolutely unhealthy dwellings and tenants are aways found for them.

It is useless to call upon the architects only, to put an end to so many absurdities, dangerous to public health. Indeed, for a long time schools of architecture have taught the necessity for hygienic construction of dwellings, and it must therefore be inferred that the competent architect has not been capable of having his views adopted. He constructs what he is told to construct, and in the manner that his client wants it. The movement must then originate from a higher source, and it belongs to the municipal authorities to step in to safeguard the health of the public.

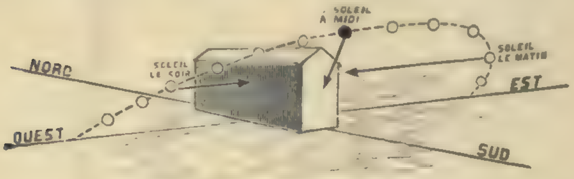


Fig. 2.—Hygienic Orientation (Trelat).

The public authorities should boldly undertake the fight against the cupidity of real estate owners. They should not, indeed, hesitate. "Let no one," writes Cheysson, "speak of the violation of the right of ownership. If ownership has rights, it also has duties, and the respect for the interests of the proprietor cannot go so far as to deliver up to him, without control and counter-weight, the life of the families he lodges in his property. If, indeed, ownership is one of the foundations of society, public health is another of them, and it has also a right to consideration."

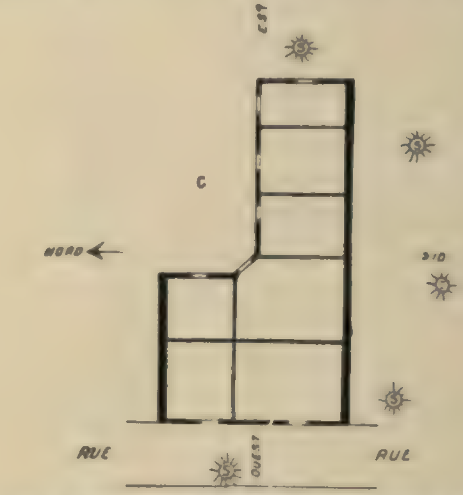


Fig. 3.—Dwelling forming part of a block of houses. Sunlight does not enter the yard C, on which, nevertheless, are the greater number of the windows of the building. The approximate course of the sun is represented by radiated circles.

It seems to us hardly necessary to insist on the necessity of allowing the air to renew itself all around the buildings of our cities. The city air is being loaded, unceasingly, with all sorts of emanations, and it is only by its movement, that is to say, by its constant renewal, that the atmosphere of the cities can maintain a relative degree of wholesomeness; for, as all know, it can never be compared to the atmosphere of the country. Now, what is true for the whole city, in general, is equally true for any dwelling in particular; hence the

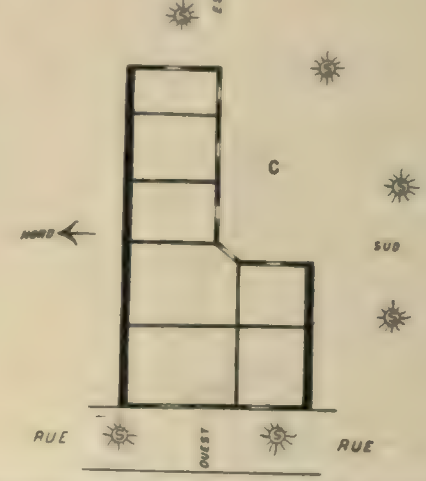


Fig. 4. Orientation which it would have been so easy to give to the same dwelling in Fig. 3 to have sunlight in the yard C, and, thereby, in the several apartments opening on it.

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*Trelat Questions de Salubrite—Paris 1908.

absurdity of the closed yards in which the air is not renewed.

Defective Orientation of Dwellings.

To have sunlight in ali the rooms of a dwelling, at certain hours of the day, these rooms should have, at least, one of their windows opening either on the east, or on the south or on the west; indeed, there is never any sun coming from the north side. In the country, the architect generally encounters no difficulty whatsoever. In the city, when, for example, the building is to be erected in the centre of a block, he is obliged to place the building so that the only two surfaces which can be used to secure sunlight, shall be on a side that the sun passes (east, south or west) and increase, if necessary, the extent of these two facings to lay out there the principal rooms. It is precisely in this orientation of the construction that one will be given, and from the start, the opportunity to judge of the skill of an architect. If in the preliminary sketch, submitted to his client, the architect has not sufficiently avoided a northern or even a north-eastern aspect, it is useless to proceed any further, for he has evidently failed in his task. Everything is to be begun anew, if one wishes to have a healthy dwelling.

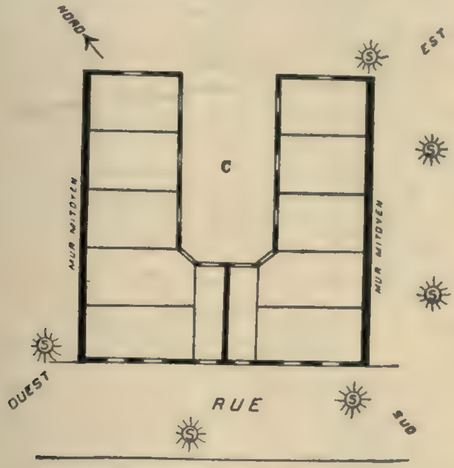


Fig. 5.—Defective orientation given to flats. The sunlight does not enter into the yard C.

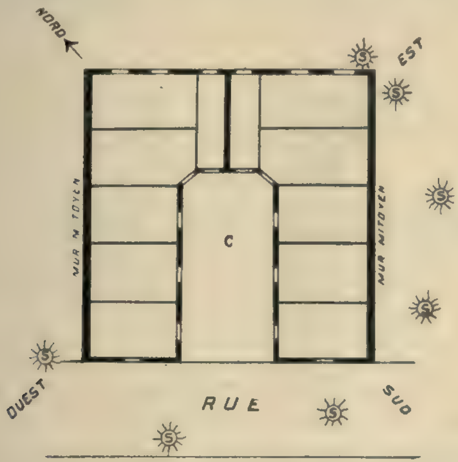
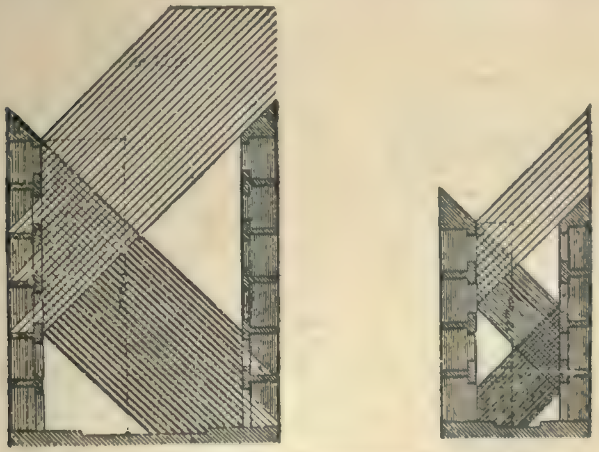


Fig. 6.—The same house as in fig. 5, but with proper orientation, to allow sunlight in the yard C.



Figs. 7 and 8.—Sunlight by reflected rays is the only one possible in narrow streets.

Fig. 1 represents a faulty orientation, the large north facade being deprived of sunshine. Fig. 2 shows the proper orientation.

On lots that are very deep, but at the same time very narrow, the architect, to facilitate the lighting of the apartments, generally breaks the straight line of the posterior surface and gives to the building the form of an L. This is a favorable issue for many difficulties, but provided that the extension be made on the proper side. We note many dwellings where the extension has been placed, as if on purpose, so as to form a screen, on the only side from which the sun could reach the building; when it would have been just as easy to place it on the other half of the lot, as is always done by sanitary architects. Figs. 3 and 4 help to make clear the opposite effects obtained by a faulty and by a proper orientation of building with extensions.

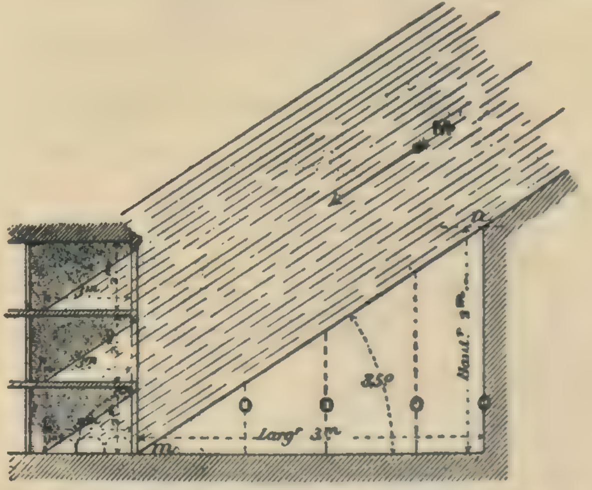
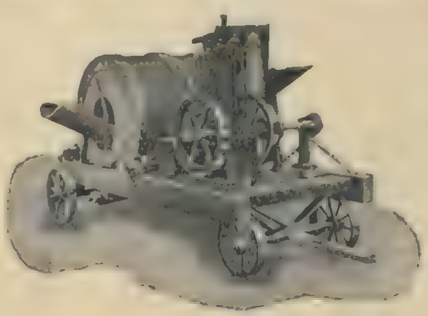


Fig. 9 – Sunlight secured by direct rays, since the height of the buildings is in proportion to the width of the street.

There has been for some years an infatuation for the collective houses of several stories, styled "apartments" or "flats." Many of them have been built, without any care whatever having been taken as to their orientation; consequently in many of these "a la mode" constructions, most of the rooms receive no sunlight. Fig. 5 shows the defective orientation given to some of our twin-flats, forming part of a block of dwellings. The majority of the rooms open on the courtyard C, where the sunlight cannot penetrate, except during the zenith of the sun in summer, just when the families are away at the seaside, and then only in a vertical manner without any benefit for the interior of the rooms, where only oblique rays could penetrate. Fig. 6 indicates the aspect that a sanitary architect would have given to this construction, so as to allow sunlight in the yard, and thereby in the several rooms opening on it.

If a street is too narrow for the height of the houses bordering it, only the rooms of the upper stories will receive the sun rays directly. The lower stories will only receive sunlight reflected from the opposite wall,



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No.	JOBS	1st. Quality	2nd Quality
104	Public Office Bldgs. Banks, Libraries, Halls and Theatres	3,540,991	412,545
50	Private Residences	1,023,050	70,300
38	United States Government	613,639	119,115
17	Cemeteries, Vaults, Tombs and Green-houses	43,049	5,500
111	Athletic Clubs, Clubs, Universities, College and School Buildings	872,822	1,274,580
58	Hotels, Apartments, Restaurants and Supply Stores (Markets and Refrig'g Plants)	1,547,162	251,797
70	Pumping Stations and Power Houses	1,779,271	935,622
25	Natatorium Swimming Pools and Comfort Stations	281,682	59,923
41	Hospitals, Asylums, Homes	1,062,571	110,400
37	Private Stables	460,320	124,242
32	Railroad Stations and Subways	838,501	192,192
56	Mills and Factories	609,549	1,075,713
17	Police Stations and FireHouses	208,664	28,837
656	Total 1st	12,800,281	4,660,766
	Total 2nd	4,660,766	
	Total 1st and 2nd	17,461,047	
61	Bake Oven Jobs	101,694	
717		17,562,741	

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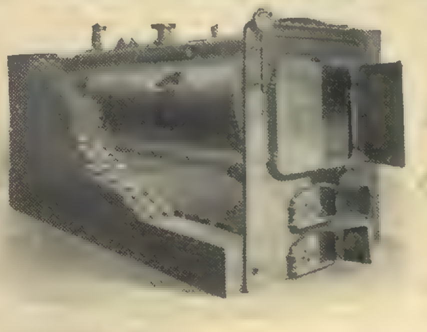

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that is a dead-light; this is shown in figs. 7 and 8. In order that the light may penetrate sufficiently into the ground floor rooms of a dwelling, it is necessary, as Trelat (1) shows it, fig. 9, that the height of the houses does not exceed the two-thirds of the width of the street. The most that hygiene can grant to certain exigencies is a height of the building equal to the width of the street.

Nevertheless it must not be inferred from this, that a municipal by-law should determine an absolutely uniform height of buildings for all the streets indiscriminately. The orientation of each particular street must be considered, before determining the height of the structures bordering it.

(To be Continued)

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(1) Trelat Questions de Salubrite Paris, 1908.

Surfacing Concrete

The most common defects in the finished surface of concrete masonry are discoloration, scaling and hair cracks. Discoloration may be due to the use of different brands of cement in the same wall, to a lack of uniform color of the sand, to the concrete being non-homogeneous in mixture, or to the use of neat cement mortar paints. Scaling is due to the plastering or painting of the wall with a rich or neat mixture. The fretwork of fine cracks is due to the common practice of using a cement mortar facing against the face forms. The appearance of these cracks is readily explained by the fact that the amount of shrinkage of concrete in settling is less than that of cement mortar.

The following method of surfacing concrete should eliminate all of these defects and give a smooth and durable finish. Prepare a smooth and tight form, oiled, and in accordance with the usual instructions. While laying the concrete pry back the body mass with a flat-bladed tool. This is not for the purpose of forcing the mortar to the front as is sometimes supposed, but to prevent the arching of the stones against the forms and the production of voids in the surface. A convenient tool for this purpose is made by welding a piece of steel plate to a rod. After the concrete has attained a consistency which will allow of the removal of the face form, but when it is still green and tender, go over it with a calcimine brush and plain water until the marks of the forms have been entirely removed. When the masonry has hardened the surface may be rubbed smooth with a carborundum brick or a briquette of cement mortar. It is important that the concrete be kept damp during the process of setting; otherwise the surface may dry out and leave insufficient water for crystallization. This may be done by covering the masonry with a wet tarpaulin and keeping it damp.

Nineteen new grain elevators are to be built in Alberta this summer. The elevators will be built by the National Elevator Company, of Buffalo, which is extending its operations into western Canada. The points decided upon are. Macleod, Granum, Claresholm, Staveley, Nanton, Cayley, High River, Crossfield, Carstairs, Red Deer, Alix, Erskine, Stettler, Camrose, Bawlf, Daysland, Killam, Strome and Sedgewick.

The lumber mills of Vancouver Island are now finding it necessary to operate their plants continuously to their full capacity The Genoa Bay Mill, owned by the International Lumber Company, is preparing to open up after being shut down for twelve years. Much the same condition of affairs is apparent elsewhere. At Shawinigan and Cowichan lakes the mills are exceedingly busy, much more so than has been the case for many months.

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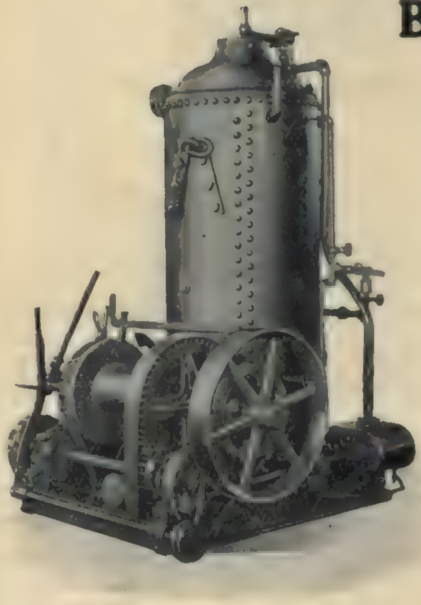

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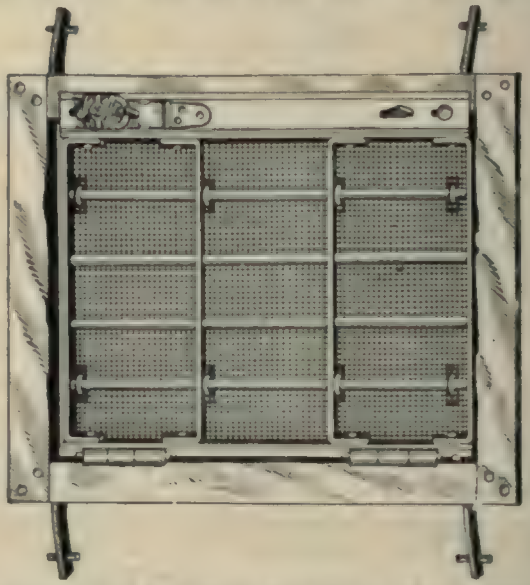

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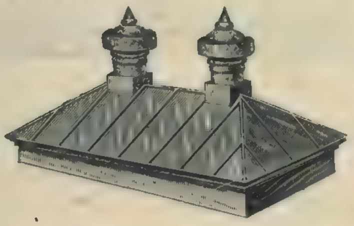

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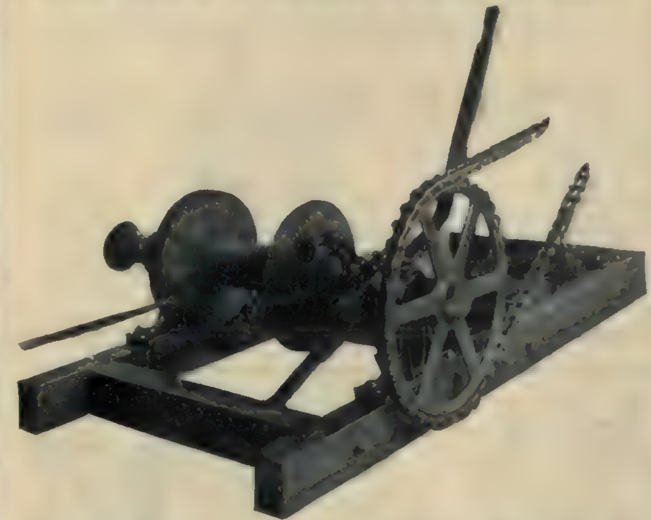

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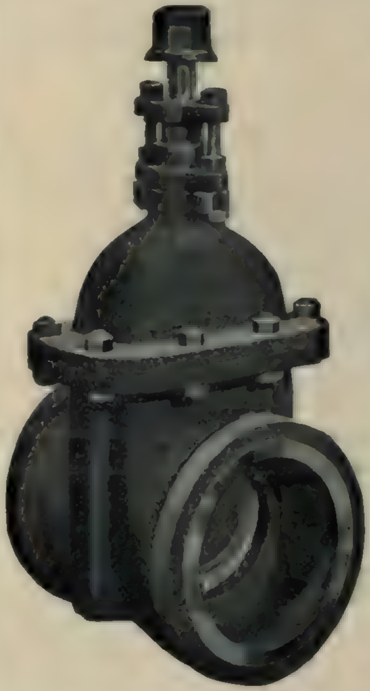

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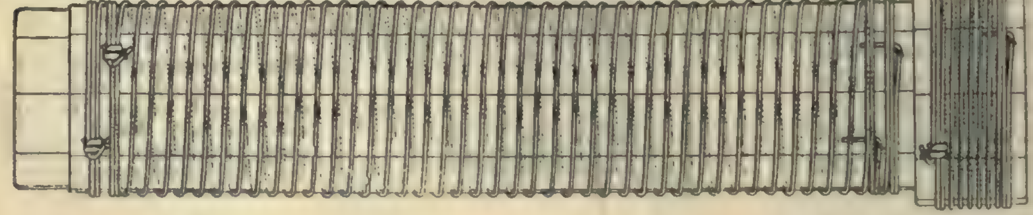

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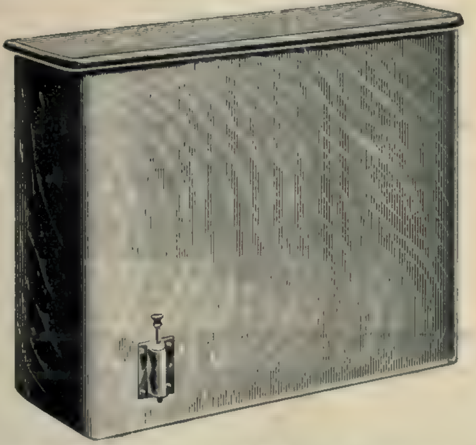

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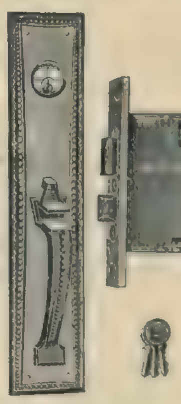

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Belleville, Ont.
The Board of Works is considering the construction of a number of sewers.

Berlin, Ont.
The Council have decided to submit a by-law for $19,000 for paving work on King street.

Brandon, Man.
A trunk sewer will be built on Pacific avenue, Eighteenth street and Rosser avenue. Work will commence at once.

Bright, Ont.
Tenders addressed to W. G. Henderson will be received until June 15th for the construction of the Cornell drain extension in the township of Blandford. Plans and specifications may be seen at the office of F. G. Ure, C.E., Woodstock, Ont., or at the office of W. G. Henderson, township clerk, Bright, Ont.

Calgary, Alta.
City Engineer Childs has completed his report on the proposed gravity water system. The cost is estimated at $290,000, exclusive of reservoir.

Claresholm, Alta.
The ratepayers will shortly be asked to vote on a by-law to raise $74,000 for the installation of a water and light system. It is proposed to put in a gravity water system.

Dunnville, Ont.
Plans for the partial treatment of Dunnville sewage before its discharge into the Grand River have been prepared by Willis Chipman, C.E., of Toronto, and approved by the Provincial Board of Health.

Gravenhurst, Ont.
Tenders for the erection of a pump house for the new waterworks system will be taken at once.

The ratepayers have approved a by-law to raise $20,000 for the installation of a waterworks system.

Guelph, Ont.
Tenders will be received for construction of brick, concrete, tar macadam and macadam pavements throughout the city. (See advertisement.)

Glace Bay, N.S.
The City Council will shortly ask the ratepayers to sanction a loan of $30,000 for improvements to the reservoir.

Halifax, N.S.
The Board of City Works have recommended to the council that $30,000 be borrowed for new sewers, $15,000 for permanent sidewalks and $70,000 for water improvement and extension.

Hull, Que.
The special committee of the City Council have approved a proposition to submit a by-law authorizing the borrowing of $100,000, mostly for civic improvements. The apportionment is: Draining of Lake Flora, $50,000; completion of waterworks, $21,000; opening of Chaudiere street, $7,000; opening of Alma street, $2,000; improvements on streets, $11,000; paving of streets along belt line, $7,000; old note on waterworks, $5,000; steam roller, $5,000. The original estimates of Chaudiere street were $14,000, but the International Portland Cement Company are giving all the cement needed. As the work includes the construction of a bridge, this offer means a reduction of half the original estimate.

Kamloops, B.C.
The by-law to raise $10,000 for water extensions recently received its preliminary readings. On motion of Ald. Brown the amount was increased to $15,000.

Lindsay, Ont.
At a recent meeting of the Provincial Board of Health, Mr. J. D. Flavelle, Chairman of the Water Commission of Lindsay, submitted plans for the new system of purification of water by mechanical filter and ozonizing. Drs. Sheard and Hodgetts were appointed to inspect the plant and pronounce upon its possibilities for giving pure water.

Montreal, Que.
A by-law for new sewers and sidewalks was passed recently by the town of St. Paul.

For the completion of the aqueduct works the Water Committee have asked for a further grant of $457,000.

Tenders addressed to John R. Barlow, City Surveyor, City Hall, and endorsed "Tender for Sewers," will be received up to noon 10th June, 1909, for the construction of sewers as under: Second avenue, from Masson street to Petite Cote road, intersection Third avenue and St. Jerome street, etc. Any information required will be furnished on application to the City Surveyor's office, City Hall.

The City Council have declined to accept the report of the Road Committee recommending that the contract for paving certain streets with granite blocks be awarded to the Hassan Paving Company at $266,000. It is understood that fresh tenders will be called for.

Markdale, Ont.
The plans submitted for a waterworks system at Markdale will be passed by the Provincial Board of Health after a few amendments have been made.

Midland, Ont.
The ratepayers will be asked to raise $12,000 by debentures for the construction of cement sidewalks. The town clerk has been authorized to advertise for construction of same if approved of by ratepayers. Tenders to be submitted by June 21st.

North Bay, Ont.
Extensions to the sewer and water system are being considered by the Town Council.

Niagara Falls, Ont.
A low level sewer will be put in on Main street at a cost of $1,800.

North Toronto, Ont.
The report and plans prepared by T. Aird Murray, C.E., of Toronto, for a sewerage disposal system for this municipality were recently accepted by the Provincial Board of Health.

North Vancouver, B.C.
The authorities are considering the extension of the waterworks system. Address Engineer Hanes.

New Liskeard, Ont.
Tenders for the construction of a sewer and septic tank in connection with the Lady Minto Hospital will be received until June 15th by A. N. Morgan, secretary.

Owen Sound, Ont.
Tenders will be received by chairman of waterworks committee for installation of waterworks system. (See advertisement.)

Ottawa, Ont.
Tenders will be called at once for the construction of asphalt pavements on Rideau street between King Edward avenue and Charlotte; Slater street between the canal and Bank street and Henderson avenue between Laurier and Osgoode. Newton J. Ker, City Engineer.

Prince Rupert, B.C.
Negotiations between the Provincial Government and the G. T. P., looking to the installation of a new waterworks system, are proceeding favorably.

St. Louis, Que.
Tenders addressed to A. F. Vincent, secretary-treasurer, will be received until June 11th for supply of 15 ton steam road roller and crushed stone (2 inch and screening). Further information and forms of tender on application.

South Vancouver, B.C.
E. N. Harvie, municipal engineer, advises us that a by-law will shortly be submitted for the purpose of raising a loan for a water distribution system. The piping will be mainly wooden stave pipe, wire wound. Enquiries re supply of same are invited; also for valves, hydrants, etc.

Toronto, Ont.
J. C. Forman, assessment commissioner, gives notice of the construction of proposed local improvements, including a 24 foot asphalt block pavement on Dufferin street, estimated to cost $11,042, sewer construction and grading.

Ville Emard, Que.
The Council will lay a number of permanent sidewalks this season.

Vancouver, B.C.
In a report presented at a recent meeting of the City Council, Mr. W. A. Clement, city engineer, outlined plans involving an expenditure of $133,250 for sewer extensions.

Victoria, B.C.
At a recent meeting of the City Council, the report of the streets, bridges and sewers committee was received and adopted. The report calls for several local improvement works.

The ratepayers have approved a by-law to raise $125,000 for the purchase of water pipe and the extension of the waterworks system; also a measure to raise $45,000 for necessary sewer extensions, and the Causeway Local Improvement by-law to provide funds for the paving of the Causeway those portions of Belleville and Homboldt streets between Government and Douglas streets, and the grading and draining of Douglas street.

Waterloo, Ont.
Over $20,000 will be spent in improving roads and bridges in Waterloo county this season.

Winnipeg, Man.
The Board of Control are considering an application for the construction of a larger water main on River avenue, between Main and Osborne streets. Estimated cost $7,000.

At a recent meeting of the Board of Control it was decided that the following asphalt pavements be placed on the order paper to be done: Fort street, from Portage avenue to York avenue, and Henry avenue, from Chambers to Tecumseh street. Tenders will be called for the work.

Winnipeg. Man.
Tenders addressed to M. Peterson, Secretary, Board of Control, will be received until June 14th for the erection of pump house at well No. 7. Plans and specifications may be obtained at office of City Engineer Ruttan, 233 James avenue.

AWARDED.

Brampton, Ont.
The contract for the extension to the waterworks was awarded to James Heatley, the lowest tenderer.

Hull, Que.
At a recent meeting of the Council, the contract of Carriere & Wilson, for the extension of the waterworks, was confirmed at $7,000.

North Toronto, Ont.
The Royal Artificial Stone Paving Company have been awarded the following contracts, their tenders being the only bids submitted: Yonge street sidewalk, five feet in width, 68 3-4 cents per lineal foot; Glencairn sidewalk, four feet in width, 55 cents per lineal foot; Glenwood avenue and Douglas avenue, 4 foot walk, 53 1-2 cents per lineal foot, and Gordon street, 4 foot walk, 49 1-2 cents per lineal foot.

Niagara Falls, Ont.
A contract has been given to Peter Lorenzo for concrete walks, 11 1-2 cents a square foot, and curbs 8 cents.

Outremont, Que.
At a recent meeting of the Council tenders were opened for 30,000 square feet of concrete sidewalks. The contract was awarded to R. T. Smith & Company, the lowest tenderers, at twenty-four cents per square foot.

Toronto, Ont.
At a recent meeting of the Board of Control, tenders were opened for twenty-seven sidewalk contracts. The city engineer was the successful tenderer for no less than sixteen of these.

Winnipeg, Man.
At a recent meeting of the council, the following tenders were awarded: Cedar block pavement, College avenue, to the engineer, $2,447.60; block pavement on lane between Furby, Langside, Buell and Preston, engineer, $1,872.28; repairing floor of Louise bridge, Edwin Doidge, $595; granolithic walk, on Powers, Thos. Jackson & Son, $527; granolithic walk, on south side of Anderson avenue, Galbraith Bros., $1,139; granolithic walk, south side McAdam avenue, engineer, $378; granolithic walk, north side of Inkster avenue, engineer, $2,436; granolithic walk, north side of Redwood avenue, Thos. Jackson & Son, $918; granolithic walk, south side of Redwood, engineer, $325.08; granolithic walk, north side of Logan, engineer, $787.20; granolithic walk, south side of Logan, engineer, $806.40; granolithic walk, south side of McDermot avenue, Thos. Jackson & Son, $871.20.

Railroads, Bridges and Wharves

Guelph, Ont.
The Wellington County Council has passed the special report on the Elora & Saugeen roads, recommending that two new bridges be erected at Clifford and Furguson's.

Montreal, Que.
A communication has been sent to the Roads Committee, by the C. P. R., to the effect that the company will donate the sum of $6,000 towards the reconstruction of the bridge over St. Catherine street east. The company states that it is willing to give the money on the understanding that certain pillars supporting the bridge shall be built in such a way as to give the company more room for its tracks at this point. The matter will be decided at the next meeting of the Roads Committee.

Saults St. Marie, Ont.
Tenders addressed to C. N. Coborn, chief engineer, M. & N. S. Railway, will be received until June 15th for the clearing, grading and bridge work in the first eight-mile section of the Manitoulin & North Shore Railway, from mile fourteen west. Particulars on application to Mr. Coborn.

Toronto, Ont.
The Provincial Government will take fresh tenders for bridge construction in the northern districts in connection with the new colonization roads being built. The Minister of Public Works reported that the prices submitted on the first call were too high.

The Dominion Railway Commissioners have confirmed their previous order respecting the construction of a viaduct along the water front, and have also approved the plans of the G. T. R. for the depression of tracks from Bathurst street westerly to the Queen street crossing, west of the Humber river. The Commissioners have dismissed the application of the railways to substitute subways at Yonge and Bay streets for the viaduct scheme and have ordered the elevation of the tracks within two years. The estimated cost of the viaduct, as given by City Engineer Rust is from $3,000,000 to $3,500,000.

The Board of Control opened tenders last week for the widening of the Dundas street bridges, for which the City Council voted $45,000. Of two tenders submitted, one was for $62,000 and the other $65,000. The former tender included an alternate proposition, to construct a new steel bridge, north of the present one, to carry only the street car traffic. This would cost $42,000, plus $7,000 for filling in underneath, which might be done by the city by day labor. To these tenders must be added the cost of a concrete floor on the present bridge, to be laid by the City Engineer. The controllers sent all the tenders to City Engineer Rust for report.

AWARDED.

Chipman, N.B.
The contract for the construction of a new steel bridge across the Salmon river at this place has been awarded by the Department of Public Works to the Dominion Bridge Company, Montreal. Estimated total cost, between $27,500 and $30,000.

Fort William, Ont.
The Hamilton Bridge Works Company, Limited, has been awarded the contract for a steel and concrete bridge across the Neebing river.

North Toronto, Ont.
Tenders were opened recently for the construction of a concrete bridge on Davisville avenue. That of Mr. Hyles, of Atwood, was accepted at $1,294.

Public Buildings, Churches, Schools, etc.

Belleville, Ont.
The ratepayers will vote July 5th on a by law to raise $70,000 by debentures for school extensions.

Chateauguay, Que.
Tenders have just been taken for the erection of a new Presbyterian church. Architect, J. Seath Smith, 207 St. James street, Montreal.

J. S. Smith, architect, Montreal, is preparing plans for the erection of a club house at this place.

Dartmouth, N.S.
The D. B. C. A. have inaugurated a campaign to raise $20,000 for the erection of a new building for the association.

Fort William, Ont.
The matter of selecting a site for the new public library is to be settled by the vote of the ratepayers.

Guelph, Ont.
The Board of Education is said to be considering the erection of a technical school.

Montreal, Que.
William Morris will erect a new vaudeville theatre on St. Catharine street at an estimated cost of $250,000.

The request of the King's Daughters for a plot for a shelter on Mount Royal has been granted.

Messrs. Schuberts have purchased the Princess Theatre, and it is their intention also to erect an additional theatre in the east end for the Columbia Company.

A site has been selected on St. Lawrence Boulevard above Ontario street for the erection of a Yiddish theatre to accommodate 700 people. Mr. L. Mitnik has charge of the undertaking. C. Dufort, architect.

Niagara Falls, Ont.
At a meeting of the joint committee of the council and library board, held on June 3rd, the plans of C. M. Borter for the new library were accepted. Tenders will be called at once.

Ottawa, Ont.
Tenders will be received June 17th for the construction of a building for Mines Branch Fuel Testing plant. Napoleon Tessier, Secretary, Department of Public Works.

A permit has been issued to the Grand Trunk Railway for the erection of a hotel on Major's Hill Park to be known as the Chateau Laurier. Estimated cost, $864,000.

Sackville, N.S.
The Fawcett Memorial Hall is to be erected here this season by Mrs. F. Ryan and Chas. W. Fawcett at a cost of upwards of $100,000. Work will start immediately.

Sherbrooke, Que.
Tenders addressed to N. Tessier, Secretary, Department Public Works, Ottawa, will be received until June 17th for electric light fixtures for the drill hall. Plans and specifications may be seen on application to J. W. Gregoire, architect, Sherbrooke, Que., and at the Department at Ottawa.

St. Catharines, Ont.
Tenders addressed to A. E. Nicholson, architect, will be received until June 14th for alterations to the Queen Street Baptist Church.

Stratford, Ont.
Tenders addressed to C. F. Neild will be received until June 12th for the erection of the bell tower on St. James' Church. Plans and specifications may be seen on application to R. B. Barber, architect, 59 Daly avenue.

Thessalon, Ont.
Tenders addressed to E. C. Bridge, secretary, school board, will be received until June 22nd for erection of eight room school.. Architects, Demar & Murdock, Sault Ste. Marie, Ont.

Toronto, Ont.
Tenders for light fixtures for the public bath house on Stephanie place will be received until June 10th by Joseph Oliver, Chairman, Board of Control. Plans and specifications at office of City Architect.

The members of the County Orange Lodge contemplate the expenditure of $40,000 upon improvements.

The Works Committee are asking the Board of Control to make an appropriation of $30,000 for the construction of new stables adjoining Willowvale Park.

It is said that the city will probably sell the Bay street fire hall in order to provide funds for the erection of four other fire halls on the outskirts of the city at an estimated cost of $135,000.

Vonda, Sask.
The town school was recently destroyed by fire. The school trustees will rebuild on a better scale.

Winnipeg, Man.
The Central Church is to be enlarged by the addition of two rooms for school purposes. A. J Carson is the contractor.

The Manitoba Government has sold $762,000 bonds. Of this amount $200,000 will be used to erect an addition to the Winnipeg Court House.

AWARDED.

Medicine Hat, Alta.
The contract for the construction of the new high school has been awarded to Everard & Oakes at about $38,000. James Rae was the successful tenderer at $9,000 for heating, plumbing and ventilating.

Montreal, Que.
E. F. Dartnell, agent for the Kittanning Brick & Fireclay Company, has received the contract to supply the grey brick for the Montreal technical school.

Ottawa, Ont.
Wilson & Holmes, contractors, this city, were the successful tenderers for the new Hintonburg school and the new St. Mary's school, Bayswater.

Toronto, Ont.
At a recent meeting of the Separate School Board, tenders for the new four room brick school to be erected in St. John's parish at a cost of $14,269, were accepted as follows: W. J. Keane, mason and brick work (subject to revision for the hot water system); Madden Bros., carpenter work; Reid & Brown, steel structure; M. J. Phelan, painting; W. J. Toley, plastering; and Ormsby & Company, roofing.

Residences

Hamilton, Ont.
Recent building permits include: E. New, brick dwelling, Marguerite street, between Sophia and Dundurn, $2,200; W. Theaker, brick house, Victoria avenue, for G. C. Hoar, $2,000

Ottawa, Ont.
Recent building permits include: F. H. Cluff, three brick veneered dwellings, Gladstone avenue, $6,000; Arthur Major, brick veneered dwelling, Clarence street, $2,000; Mrs. Howlett, brick veneered dwelling, Somerset street, $4,000.

Toronto, Ont.
Gough Bros. have purchased from Albert Nordheimer the property at the northwest corner of Bloor street and Avenue road, where they will erect a $250,000 apartment house.

Winnipeg, Man.
Plans are being prepared by G. W. Northwood, architect, for a three storey apartment building, corner of Qu'Appelle and Carlton streets, for D Kirkwood.

AWARDED.

Blenheim, Ont.
The Manse Committee of the Presbyterian Church has awarded the contract for the erection of a new residence on MacGregor street to H. Collar. Estimated cost $3,500. Architects, Wilson & Arnold, Chatham.

Montreal, Que.
E. W. Barnes, designer, 2126 Mance street, has awarded the general contract for the erection of flats on Hutchison street annex, for Mr. Goodwin, to the Pierce Construction Company.

E. & W. S. Maxwell, architects, 6 Beaver Hall Square, have awarded the contract for the erection of a residence on Ontario avenue, for Mr. Cowan, to J. H. Hutchison & Company, general contractors, Bourget and St. Ambroise streets.

J. Seath Smith, architect, 207 St. James street, has awarded the general contract for the erection of two houses on the plateau, New Westmount, for Mr. Bingley, New York, to Jackson & Company, 335 Hibernia street.

Joseph Perreault, architect, 17 Place d'Armes Hills, has awarded the contract for roofing, plumbing and heating in the eight dwellings being erected for J. M. Dorrion, to Joseph St. Amand.

Vaudreil, Que.
R. Montgomery Rodden, architect, 8 Beaver Hall Square, Montreal, has awarded the following contracts for alterations and repairs to country residence for W. T. Rodden:—Painting, Murphy & Son; plastering, J. McLean.

Westmount, Que.
Hutchison, Wood & Miller, architects, Royal Insurance Building, Montreal, have awarded the following contracts for the erection of a residence on Forden avenue for Norman White; excavations, masonry and brick, Robertson & Hutchison; plumbing and heating, John A. Gordon.

R. Montgomery Rodden, architect, 8 Beaver Hall Square, Montreal, has awarded the contract for the plastering of a residence on Clarke avenue, Westmount, for Mr. Oliver, to M. McCarthy, Montreal.

Business Buildings and Industrial Plants

Barnet, B.C.
A. McLaren, president of the North Pacific Lumber Company, whose mills at Barnet were recently destroyed by fire, states that the erection of a more modern mill will be begun immediately. The new mill will cost about $350,000.

W. F. Gardiner is preparing plans for a modern office building to be erected at the corner of Wellington and Westminster streets.

Compton, Que.
Damage to the amount of between $8,000 and $10,000 was caused by fire at Moes River, near this place, last week. Parsons Bros.' mill was badly damaged and several other buildings were destroyed.

Cranbrook, B.C.
The Royal Bank of Canada plan the immediate erection of a stone and brick building.

Calgary, Alta.
The G. F. & J. Galt Company have purchased a site on Tenth avenue for the erection of a five storey warehouse.

Cartwright, Man.
The building of Jas. Gray was destroyed by fire recently at a loss of $5,000.

Campbellton, N.B.
The Nordin Company will build a large up-to-date woodworking factory and lumber mills at Tide Head. A large quantity of machinery has been ordered from Sweden.

Cobourg, Ont.
Tenders for the construction of a new horse barn to be erected at the grounds of the West Northumberland Agricultural Society will be received until June 12th by T. S. Chatterton, secretary. Plans at office of J. C. Rosevear, town hall, Cobourg.

Chatham, Ont.
Tenders addressed to J. L. Wilson & Son, architects, will be received until June 12th for all trades in the erection of an implement building for Donovan & McNaughton, of Chatham.

Kenora, Ont.
Tenders addressed to G. A. Beatty, secretary, building committee, will be received until June 15th for the erection of the I. O. O. F. block in this town. Plans and specifications at the Workingmen's clothing store, Main street, Kenora.

London, Ont.
A number of Pittsburg capitalists are considering London as the possible site of a large manufacturing concern. The plant when established will be a large one, employing 600 men. No further details to hand.

North Hatley, Que.
Glenvilla, the summer resort here, was destroyed by fire last week at a total estimated loss of $60,000.

Ottawa, Ont.
It is expected that work will now proceed expeditiously upon the construction of the Grand Trunk hotel, an order-in-council closing the deal between the Government and the company having been passed at a recent meeting of the Cabinet. The structure must be completed within two years.

Port Hope, Ont.
The book store of G. V. Strong was damaged by fire last week. Estimated total loss $6,000.

Port Arthur, Ont.
The Bank of Montreal has purchased a site for the erection of a new branch building.

It is stated that negotiations are in progress between a Chicago syndicate, represented by F. Holland, and the city council with a view to the establishment of a factory for the manufacture of radiators from the output of the Atikokan Iron Company's blast furnaces.

St. Thomas Ont.
Architect Darrach is preparing plans for a cement roller mill for S. V. Wilson, of Union, Ont., to be erected on the former site. The mill will be modern in every respect, and will be operated by water power.

Toronto, Ont.
The premises of J. Landreville & Son, coopers, Tecumseh street, were badly damaged by fire last week.

The Polson Iron Works Company has decided to extend its operations and has applied to the city for a lease of fifty acres of land at the east end of the Bay, near Keating's Cut. A general shipbuilding plant will be installed on a large scale, and in connection with it there will be a floating dry dock capable of taking in the largest of the lake-going vessels. The dry dock is to be built in sections, and when the Welland canal is deepened, which is shortly to be done, the dry dock will be further enlarged.

Vancouver, B.C.
The Leeson-Dickie Grocery Company will erect a large building corner of Water and Abbott streets.

Victoria, B.C.
Henry Young & Company have purchased the property occupied by T. N. Hibben & Company on Government street and will make extensive alterations to same.

Winnipeg, Man.
The T. Eaton Company are stated to be contemplating important extensions.

It is stated that J. W. Wood, manufacturer of contractors' supplies, tents, etc., Ottawa, Ont., will establish a large factory in Winnipeg during the present season.

Woods Western, Limited, will erect a five storey building, 70 x 200 feet, at a cost of $250,000.

AWARDED.

Montreal, Que.
Peden & McLaren, architects, 20 St. Alexis street, have awarded the following contracts for repairs to the Bank of Montreal premises at the corner of Seigneurs and Notre Dame streets: Pointing, A. E. Wand; painting and decorating, F. Lefebvre & Company.

The Terrano Flooring Company, Limited, 22 St. John street, have closed the following contracts for Terrano floors: J. A. Jacobs, Mitchell & Crighton, architects; Old People's Home, Longue Pointe, Hutchison, Wood & Miller, architects; C. J. Crowdy, house, Brown & Vallance, architects; W. L. Chipchase, two houses, Alex. W. Crosman, architect, Montreal; Crossley Apartment house, Toronto, Foulds & Limpricht, architects; Asylum for the Insane, St. John, N.B.

The general contract for the addition and installation of concentrating stills in the premises of the Paterson Manufacturing Company has been awarded to Gray & Wighton, contractors, this city.

Peden & McLaren, architects, 20 St. Alexis street, have awarded the contract for the alterations to the Royal Trust Building, St. James street, to Byers & Anglin, general contractors, 18 St. Alexis street, Montreal.

Winnipeg, Man.
The Eadie-Douglas Company, Montreal, have been awarded the contract for the supply of terra cotta for the new twelve storey McArthur building, Winnipeg. J. H. G. Russell, architect; Carter, Halls & Aldinger, contractors, Winnipeg. It is understood that this is one of the largest contracts for terra cotta ever awarded in Canada.

Chas. W. Sharpe & Company have secured the contract to erect the head office building for the Great West Life Assurance Company on Lombard street, at $170,000. The entire cost of the building is to be $230,000. J. D. Acheson, Winnipeg architect.

Power Plants, Electricity and Telephones

Calgary, Alta.
Tenders addressed to Smith, Kerry & Chase, consulting engineers, 68 McDougall block, Calgary, will be received until June 15th for excavations, tunneling and coffer-dam at Horseshoe Falls, Bow river, 50 miles west of this city, on the main line of the C. P. R. Full particulars may be obtained on application to Smith, Kerry & Chase, Carnegie Library Building, Winnipeg.

Creston, B.C.
The Goat River Power & Light Company proposes to construct a power plant on the Goat River Canyon and will furnish electricity for lamps and motors and other purposes. The company also plans to construct an electric railway to extend from Creston to the Goat River, ten miles in length, work on which will commence within a year. The officers of the company are: R. S. Lennie, of Nelson, B.C., president; W. K. Essling, of Rossland, B.C., vice-president; J. B. Anderson, of Trail, B.C., secretary and treasurer, and W. F. Teetzel, Nelson, B.C., general manager.

Fernie, B.C.
At a recent meeting of the City Council tenders were accepted for the construction of pole line distribution and machinery in connection with the municipal electric light system.

Govan, Sask.
Tenders will be received up to June 15th for the construction of about sixty pole miles of the Govan Rural Telephone Company, Limited. Thomas Fargey, secretary.

Hamilton, Ont.
Preparations are being made by the Cataract Power Company for the new lighting contract which goes into effect July 1. Additional lamps are to be installed. It is said that there will be no gas lamps used after July 1.

Lethbridge, Alta.
The Alberta Government has decided to install an automatic telephone system here. Address W. H. Cushing, Minister of Works.

Macdonald, Man.
H. Grills, secretary-treasurer of this municipality, invites tenders for $6,000 telephone debentures. The money is required to complete the local system.

Niagara Falls, Ont.
The Hydro-Electric Commission will erect a large transformer building at Falls View.

The Niagara Falls Power Company, Buffalo, N.Y., have concluded financial arrangements for carrying out additional construction on the Canadian side of the river at a cost of $4,000,000.

Peterborough, Ont.
The line for the electric railway between Cobourg and Peterborough has been surveyed from Cobourg to Rice Lake, and will be completed to Peterborough in a few weeks. It is expected that contracts for the construction of the road will be let shortly.

Saskatoon, Sask.
Tenders addressed to J. H. Trusdale, city clerk, will be received until June 22nd for the following: (a) 500 Kw. 2,200 volts, 60 cycle, 150 r.p.m., 2 phase generator, exciter and switchboard, installed complete; (b) 750 h.p., 150 r.p.m. vertical cross compound Corliss engine, with the necessary condensing apparatus, installed complete. Plans and specifications may be seen at the office of the Electrical Superintendent, E. L. White.

Tavistock, Ont.
The ratepayers will vote June 15th on a by-law for a $10,000 debenture for preferred stock in the People's Electric Railway Company.

Victoria, B.C.
The British Columbia Electric Railway Company is seeking to increase its water supply. The company proposes to secure an additional 25 cubic feet per second and construct a dam and power house near the mouth of the Jordan river.

Winnipeg, Man.
The date for receiving tenders for machinery in connection with the hydro-electric power development at Pointe du Bois has been changed from August 16th to August 2nd.

AWARDED.

Lethbridge, Alta.
Contracts for the construction of the municipal electric light plant have been awarded as follows: For mechanical draft and economizer to the Polson Iron Works, of Toronto, Ont., for $6,890; complete piping to Drummond, McCall & Company, of Montreal, Que., for $14,365; for crane to Mussens Limited, for $1,700; boilers and accessories to the Babcock & Wilcox Company, of Montreal, Que., for $25,410; feed pumps to the Canada Foundry Company, of Toronto, Ont., for $730; transformers to the Northwest Electric Company, of Calgary, Alta., for $1,320; electrical equipment to the Canadian Westinghouse Company, of Hamilton, Ont., for $1,449, and to Laurie & Lamb, of Montreal, Que., for engine and condensing sets, for $18,575.

(Continued on page 25)

Tenders and For Sale Department

Limestone

200 acres hard and building limestone, 82 miles from Toronto. 200 rods distant, on two road allowances, from Canadian Northern Ontario track. Deposit over fifty feet thick. Large dwelling house, barn, stables, and good well on property. Will sell whole or part. A rare opportunity to secure, at reasonable prices, unlimited supplies of first class limestone near railway with accommodation for men and teams. W. M. SHIELDS, O'Connell, Ont. 23

City of Guelph

Sealed tenders will be received by the City Clerk, until 5 p.m., JUNE 15TH, for the construction of approximately 30,000 square yards of Brick, Concrete, Tar Macadam or Macadam Pavements in the City of Guelph. Plans and specifications may be seen at the office of the City Engineer on and after June 7th.

Instructions to bidders and form of tender will be obtained at the above office.

The lowest or any tender not necessarily accepted.

JAMES HUTCHEON,
City Engineer.

City Engineer's Office,
Guelph, June 2nd. 1909. 23

Tenders

Owen Sound Water Works

Sealed bulk tenders addressed to the "Chairman of Waterworks Committee" will be received up to 6 p.m. of FRIDAY, JUNE 25TH, for any one or all of the following :—

(a) Pipe laying—25,000 ft.
(b) Construction of concrete dam.
(c) Construction of filter beds
(d) Construction of 5 million gallon concrete reservoir.

A certified bank cheque payable to the Treasurer of the Town of Owen Sound for five per cent. of the contract price to accompany each tender, the same to be forfeited if the successful tenderer declines the contract or fails in the performance thereof. Cheque to be returned in case of non-acceptance.

Plans and specifications can be seen at the office of the Town Engineer.

The lowest or any tender not necessarily accepted.

JOHN McQUAKER, Chairman Waterworks Com.
R. McDOWALL, C.E., Town Engineer.

Owen Sound, Ont.,
June 2, 1909. 24

Tenders for
Waterpipe and Cement
Town of Owen Sound

Sealed tenders, addressed to the Chairman Waterworks Committee, will be received up to 6 p.m. on SATURDAY, JUNE, 12TH 1909, for the following paproximate quantities :—

Waterpipe	18 inch D.		3,000 ft.
	12 "		20,000 "
Lead			14 tons
Also Hydrants, Valves, Venturi Meters, Specials, &c.			
Portland Cement			4,000 bbls.
Sewer Pipe	24 inch		1,100 ft.
	12 "		1 470 "
	9 "		2,400 "
	12 "	split	264 "
	9 "	"	80 "
	6 "	"	1,600 "

Also Y's, T's, &c.

Specifications sent on apolication.

The lowest or any tender not necessarily accepted.

R. McDOWALL, C.E., Town Engineer.
JOHN McQUAKER, Chairman Waterworks Com.

23

Tenders

will be received by the City of Toronto, Canada, up till noon of JUNE 30TH, 1909, for laying between 350,000 and 450,000 duct feet of underground conduit.

For specifications, form of tender, etc., apply Electrical Department, City Hall. 25

Tenders for Bridge

Sealed Tenders, addressed to Wm. Purves, Esq., Clerk of East Whitby Township, Columbus, Ont., will be received until noon, on TUESDAY, JUNE 15TH, for the building of a 40' Reinforced Concrete Arch Bridge, near Oshawa.

Plans and specifications may be seen at the office of the Engineers.

The lowest or any tender not necessarily accepted.

BOWMAN & CONNOR,
Engineers,
36 Toronto St., Toronto.

23

Debentures for Sale

Sealed tenders will be received up till noon, SATURDAY, JUNE 19TH, 1909, for the purchase of $20,000.00 High School Debentures, of the Town of Oshawa, dated May 1st, 1909, bearing interest at 4½ per cent. per annum aud payable at the office of the Treasurer, Oshawa, in 30 equal annual instalments of principal and interest.

Also $6,000.00 Public School Debentures of the Town of Oshawa, dated June 1st, 1909, bearing interest at 4½ per cent. per annum and payable at the office of the Treasurer, Oshawa, in 30 equal annual instalments of principal and interest, purchaser to pay accrued interest.

The highest or any tender not necessarily accepted.

THOS. MORRIS,
Town Clerk.

Dated at Oshawa, June 7th, 1909. 23

Board of Education
Toronto, Ont.

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer of the Board will be received until

FRIDAY, JUNE 11TH, at 3 p.m.

For

Coal, Wood, etc.
Furniture
Grading and Sodding
Whitewashing
Calsomining and Painting
Liquid Slating
Tinsmith

Specifications may be seen and all information obtained at the Board, City Hall. Each tender must be accompanied by the deposit mentioned in said specifications and forms of tender. The lowest or any tender will not necessarily be accepted.

WM. HOUSTON, Chairman of Committee.
W. C. WILKINSON, Sec.-Treas.

23

Tenders Wanted

Tenders for the labor and materials required in the erection of all or any of the several branches of work necessary to complete proposed additions and alterations to the Park Baptist Church building, Brantford, Ont., will be received up till 12 o'clock noon, TUESDAY, JUNE 15, 1909.

Plans and specifications may be seen at the office of the Architects.

All tenders should be sealed, marked "Tender" and addressed to Franklin Grobb, Brantford, Ont.

The lowest or any tender not necessarily accepted.

TAYLOR & TAYLOR, Architects,
Hope Chambers, Brantford, Ont.

Tenders for Construction of
Granolithic Sidewalks

Sealed Tenders, addressed to M. W. Flannery, Town Clerk, will be received by the Corporation of the Town of North Bay, Ontario., until twelve o'clock, noon, 14TH JUNE, 1909, for the work of supplying material and constructing approximately 50,000 square feet of Cement Sidewalks.

Plans, Specifications, Forms of Proposals, at office of

L. O. CLARKE,
Town Engineer.

The lowest or any tender not necessarily accepted

23

Peterborough, Ontario
Waterworks

Sealed tenders, addressed to the undersigned, are invited by the Peterborough Water Commissioners, for the necessary Excavation, Coffer Dams, Concrete Dam and Pump House, Foundations, etc., for waterworks purposes, on the Otonabee River near Peterborough, Ontario, and will be received up to MONDAY, THE FOURTEENTH DAY OF JUNE, prox., at noon.

Specifications will be furnished, and plans may be seen at the office of Mr. W. Henderson, Superintendent Waterworks, Peterborough, Ontario, or at the office of the Designing Engineer, Mr. William Kennedy, Jr., Y.M.C.A. Building, Montreal, on or after the Fourth day of June, prox.

No tender necessarily accepted.

S. R. ARMSTRONG
Secretary,
Water Commissioners
Peterborough, Ont.

22nd May, 1909

23

TOWN OF CLINTON
Province of Ontario

Water Works

Sealed Tenders will be received by the Town Clerk until 8 p.m., on

TUESDAY, JUNE 29TH, 1909

for the following sections of the proposed Water Works System :

"A"—Labor Pipelaying
"B"—Pump House
"C"—Water Tower
"D"—Cast Iron Pipes
"E"—Hydrants, Valves, etc
"G"—Pumping Machinery
"H"—Producer Gas Plant
"L"—Receiving Basin

Plans and specifications may be seen at the Town Hall, Clinton, or at the office of the Chief Engineer, 103 Bay St., Toronto, on or after June 8th.

D. L. MACPHERSON, Esq., Clerk, Clinton, Ont.
H. WILTSE, Esq., Mayor, Clinton, Ont.

WILLIS CHIPMAN, C.E.,
Chief Engineer,
Toronto, Ont

Dated May 28th, 1909 24

ST. ANTHONY'S CHURCH

Toronto, Ont.

Tenders will be received until and including the 16TH INST., for the erection of the above church.

Plans and specifications can be seen at the office of the Architect, A. A. Post, 15 Toronto Street.

The lowest or any tender not necessarily accepted 23

Tenders Wanted

for

New Church

The Building Committee of St. Andrew's Presbyterian Church, Sudbury, Ontario, are prepared to receive bulk tenders for the erection and completion of a new church building on the present church site, inclusive or exclusive of heating, plumbing and electric wiring, the whole according to plans and specifications, which may be seen at the town of Sudbury, the office of Hearst, McKay & Darling, Sault Ste. Marie, Ont., the office of W. H. Tate, real estate agent, 281 Bank Street, Ottawa, and the Builders' Exchange in Toronto and Montreal.

Tenders to be in the hands of the undersigned, marked "Tender for Church," on or before MONDAY, JUNE 21, 1909, at 12 o'clock noon.

Each tender must be accompanied by an accepted cheque, made payable to the order of the Secretary-Treasurer of the Church Buildiug Committee to the amount of 5 per cent. of each tender as security of fulfilment of contract if tender is accepted.

In case the tender has been accepted, and the tenderer fails te execute the contract and requisite bond, the deposit will be forfeited to the use of the committee.

None but bulk tenders will be considered.

The lowest or any tender will not necessarily be accepted.

A. D. MELDRUM,
Secretary-Treasurer.

Sudbury, June 2, 1909. 23

Positions Wanted or Vacant

WANTED—TINSMITH for North Bay, Ont.- one accustomed to general work; state wages. Apply Box 782, CONTRACT RECORD, Toronto. 23

WANTED — DRAUGHTSMAN — first-class — for surveyor's and engineer's office, in Ontario city. Apply to Box 783, CONTRACT RECORD, Toronto. 23

TINSMITH — Four years' experience — plumbing, furnace and roofing; wants steady position. Write Box 780, CONTRACT RECORD, Toronto 23

WANTED — 3 OR 4 FIRST CLASS STONE MASONS; also a couple of good bricklayers; steady work and good wages. Box 781 CONTRACT RECORD, Toronto. 23

WANTED—AT ONCE—FOREMAN FOR GENERAL TINSHOP; must be first class workman on cornice, skylights, mill pipe and heating work; must be quick and sober; none other need write; state age and experience; wages from $5 to $6 per day, eight hours; Box 778, CONTRACT RECORD, Toronto. 23

Power Plants, Electricity and Telephones

(Continued from page 23)

Mountain, Ont.

The contract for the construction of two reinforced concrete arch bridges and two reinforced concrete piers over the Castor river and McCaul creek was awarded to R. J. Dougall, of Hallville, Ont., at $2,200. Engineers, Magwood & Walker, Cornwall, Ont.

Princeton, Ont.

The contract for the construction of two cement abutments for steel bridge over the river Nith, Blenheim Township, was awarded to Andrew Bain, of Embro, at $5.20 per cubic yard. The contract for the cement floor was awarded to the Hamilton Bridge Company, at 28 cents per foot.

Toronto, Ont.

The Board of Control has awarded the contract for lighting the newly annexed district of Wychwood to the Toronto Electric Light Company at a rate of $69 per lamp per year.

Miscellaneous

Brockville, Ont.

By-laws to provide for reconstruction of bridges and improvements to light and power plant will shortly be submitted to the ratepayers.

Battleford, Sask.

A movement is on foot to secure a fire protection system. Estimated cost $30,000.

Coaticook, Que.

Tenders addressed to O. Shurtleff, secretary-treasurer, will be received until June 25th for masonry work in the construction of a dam across the Coaticook river.

Montreal, Que.

Tenders addressed to L. O. David, city clerk, will be received until June 11th for the erection of restaurant, lavatories and house, and supply and laying of asphalt. Plans and specifications may be obtained at the office of the secretary of the Parks and Ferries Committee, city hall.

The Government will construct a number of piers at Lake St. Peter with a view to lengthening the period of navigation on the St. Lawrence river. Address R. A. Wiallard, local agent of the Department of Marine and Fisheries.

Recent building permits include: Sister du Bon Pasteur, alterations and additions to property on Fullum street, $15,000; Dufort Estate, 672 Sherbrooke street east, alterations to property at 331 St. Lawrence Boulevard, $3,600; A. Gravel, 125 Breboeuf street, house containing five dwellings on Breboeuf street, $3,000; L. J. Primeau, 537 Beaudry street, house containing three dwellings on Beaudry street, $3,800; Mde. R. Prefontaine, 374 Sherbrooke street east, two storey house Sanguinet and Place St. Louis street, $7,000; Southam Limited, St. Alexander street, block of stores and offices, Guy and St. Catherine streets, $50,000; Jos. Perron, 295 Breboeuf street, three storey house on Breboeuf street, $3,500; Catholic School Commissioners, St. Edward school, St. Denis, Beaubien and Cowan streets, $50,000; R. W. Buchanan, 234 Craig street west, three storey house on Westmount avenue, $10,000; Domina Casson, 187 Bourbonniere street, house containing three dwellings on Parc George Etienne Cartier, $3,500; Montreal Technical School, M. S. Ry. Building, on Sherbrooke, Church and Mance streets, $387,000; Antoine Serwant, 3 Wurtele street, house containing five dwellings on Davidson street, $3,000; T. M. Taylor, 334 Charlevoix street, four houses containing twelve dwellings on Rozel street, $10,000; Dominique Lapiere, 233 Carriere street, house containing two dwellings on Carrieres street, $2,000; James S. Smith, 207 St. James street, two three storey houses on Sherbrooke street west of Guy, $20,000; Nap. Surprenant, 249 Letrourneaux street, two houses containing six dwellings on Dufresne street, $5,000; G. Mariotti, 269 Ottawa street, two storey house at 12 Lorne avenue, $6,000.

Oshawa, Ont.

Tenders are being received for high school debentures. (See advertisement.)

Ottawa, Ont.

Recent building permits include: Ernest Hill, solid brick dwelling, Center street, $2,500; Alex. Christie, alterations to old Y. M. C. A. for warehouse purposes, $10,000; Dr. J. J. Leacy, brick veneered dwelling, Delaware avenue, $4,000; Dr. Robert Barnes, brick veneered dwelling, Fourth avenue, $2,900; Thomas Dean, two brick veneered dwellings, Spruce street, $3,500; V. V. Rogers, double brick veneered dwelling, Melgrund avenue, $5,000; F. J. Castle Company, solid brick warehouse, Wellington street, $12,000; G. A. Eaman, double brick dwelling, Third avenue, $3,800; T. J. Somerville, two detached brick buildings, Bayswater avenue, $3,200.

Regina, Sask.

By-laws calling for $33,000 for the extension of the electric light system, the amount for the extension of the waterworks and also an equal amount for extension of the sewage system, received their first and second reading at a recent meeting of the Council, and will be submitted to the ratepayers on June 11th.

Sarnia, Ont.

A number of Detroit capitalists recently visited Sarnia and had a consultation with representatives of the Gas & Electric Light Company relative to supplying the town with natural gas. It is the intention of the promoters of the scheme to pipe natural gas to Sarnia from the oil and gas fields near Tilbury and deliver it to the local company for distribution to patrons. It is said that the cost of bringing the gas to the town would be in the neighborhood of three or four hundred thousand dollars.

Saskatoon, Sask.

Out of ten money by-laws voted on seven carried, aggregating. $1,847,800, which includes $125,000 for a collegiate institute. The others carried were $36,000 for power house extension and $5,000 for land; $10,000 for road machinery, $5,000 for temporary city offices, $2,100 for the C. P. R. supplementary sum given for strengthening the bridge for traffic attachment, and $1,000 for Wilson Park.

Truro, N.S.

Tenders for $113,025 four per cent. thirty-year debentures, issued for sewer and water extensions and renewal of debentures, will be received until June 25th by H. G. McDougall, town clerk and treasurer.

Toronto, Ont.

Tenders addressed to W. C. Wilkinson, Secretary-Treasurer, Board of Education, will be received until June 11th for kalsomining and painting, whitewashing, liquid slating, furniture, etc. Specifications at office of board, city hall.

Recent building permits include: W. H. Martin, pair semi-detached 2 storey brick stores and dwellings, Gerrard street east, $6,000; E. B. Osler, 2 storey brick dwelling, Elm avenue, $3,000; H. Hutson, pair semi-detached 2 storey and attic brick dwelling, corner Farnham and Swan, $7,000; J. R. Marshall, 4 attached 2 storey brick stores and dwellings, Bathurst street, $12,000; Miss Sheppard, 2 storey brick dwelling, Farnham avenue, $3,000; G. E. Henderson, pair semi-detached 2 storey brick dwellings, Dupont street, $4,000; C. Coulter, pair semi-detached 2 1-2 storey brick dwellings, Crawford street, $5,000; L. Lumbers, 2 1-2 storey brick dwelling, Crescent road, $8,000; S. Johnson, alterations to dwelling, Dale avenue, $9,000; R. A. Shields ,pair semi-detached 2 storey brick dwellings, Sidney street, $5,000; H. Noble, pair semi-detached 3 storey brick stores and dwellings, Roncesvalles avenue, $6,600; I. Wood, pair semi-detached 2 storey roughcast dwellings, Wallace avenue, $4,000; H. E. Simpson & Company, per semi-detached 2 storey brick dwellings, Deleware avenue, $4,000; Dr. H. E. Cluterbrick, 2 1-2 storey brick dwelling, Grace street, $4,200; Ed. Elliott, three pairs semi-detached 2 1-2 storey brick dwellings, Follis avenue, $15,000; Dennis & Company, Limited, 2 storey brick store, Broadview avenue, $8,000; John Maguire, 2 1-2 storey brick dwelling, corner Dunvegan and Lonsdale avenue, $6,000; R. E. McDonagh, pair semi-detached 2 1-2 storey brick dwellings, Havelock street, $5,000; Geo. E. Case, 2 detached 2 storey and attic brick dwellings, Westminster, $7,000; G. P. Schofield, 2 1-2 storey brick dwelling, Scarth road, $15,000; Lawrence & Thorpe, pair semi-detached roughcast dwellings, brick fronts, near Bathurst, on Helena avenue, $3,600; J. M. Walker, pair semi-detached 2 storey and attic brick dwellings, Sunnyside, $4,000; Joseph Coulter, 2 storey and attic brick dwelling, Warren road, $7,500; Mrs. Grafton, pair semi-detached 2 storey brick dwellings, Dearbourne road, $4,000; J. H. Locke, 2 storey and attic brick dwellings, St. Clarens avenue, $3,000; R. Brundle, pair semi-detached 2 storey brick dwellings, Emerson avenue, $4,000; I. J. Best, 2 storey and attic brick dwelling, Lansdowne avenue, $3,000; H. E. Simpson & Company, two pairs semi-detached 2 storey brick dwellings, Geoffrey street, $8,000; Henry Bishopric, 2 storey and attic brick dwelling, Binscarth road, $3,500.

Winnipeg, Man.

Recent building permits include: Wright & Company, ten houses, Arlington street, between Portage and Lavinia, $14,000; St. John's Methodist Church trustees, parsonage, $3,300; W. A. Irish, three storey apartment block, on east side of Balmoral street, between Portage avenue and Broadway, $11,000; J. A. Martin, two houses on Chestnut street, $5,000; G. H. Miller, house, Corydon avenue, between John and Heep, $2,000; Fisher & McArthur, five storey apartment block, corner Cumberland and Hargrave streets, $157,000; J. H. Kolb, Atlantic avenue, residence, $2,500; Canada Weekly Printing Company, building, corner Logan and Stanley streets, $7,000; D. Dalton, Corydon avenue, residence, $2,000.

New Companies

Miner Rubber Company, Limited, Granby, Que., incorporated, capital $1,000,0000. Incorporators, H. S. Williams, M. A. Phelan, W. Bovey, J. L. Reay and T. M. Papineau, all of Montreal.

Bruce Mines Sawmill Company, Limited, Bruce Mines, Ont., incorporated, capital $60,000. Incorporators, F. H. Lawrence, of Macdonald Township; J. O'Flynn, G. W. Goodwin and T. J. Wilcox, all of Sault Ste. Marie, Ont.

Preservation of the Beautiful in the Country's Architecture

The following information concerning the organization of a society in Saxony for the preservation of the peculiarities of the older buildings in town and country, the beautifying of household interiors, and the general cultivation of the beautiful and appropriate in the surroundings of the people is furnished by United States Consul Carl Bailey Hurst, of Plauen:

Widespread interest is manifested here in a newly organized patriotic movement, called Saxon Home Protection, a branch of which has been established in this consular territory. It strives to preserve the architectural peculiarities stili seen on the older buildings in country and city, furnishes advice as to the appropriate designing of buildings and parks of every description, and takes measures against the defacement of towns and rural districts; it seeks further to develop Saxon handicrafts in connection with beautifying household interiors; it protects, as far as practicable, the old landscapes, domestic flora and fauna, and even geological formations that may lend interest to particular neighborhoods.

In some respects the society is akin to other German organizations, known as Care of Monuments, and the like, whose efforts are along closer lines in more limited localities, for the purpose of perpetuating certain survivals of earlier generations. In order to exert a stronger influence in the home field, the Saxon Home Protection finds its reason for coming into existence in this epoch of progress in the Saxon kingdom.

With the rapid advance of manufacture and commercialism, and with the growing influx of people from farms to factories ,a transformation has become strongly noticeable in building in almost every district of Saxony, which, it will be remembered, is one of the most densely populated areas on the globe. In remote parts of the country structures have been erected in urban styles, rectangular, utilitarian, foreign to local traditions and at variance with the surroundings. It is not the purpose of the new society to be ultra-conservative, but, while keeping pace with modern requirements, to endeavor to have new buildings or alterations in old ones conform to certain lines in harmony with older accepted designs popular to the locality, a result which can be obtained at no greater pecuniary outlay than by using appropriate designs, in reality, oftentimes, at smaller cost.

Encouraged by the authorities and with the assistance of the greater part of the public, much has already been accomplished to preserve the historical aspect of the country to which the Saxons are so strongly attached.

That the Saxon Government is in thorough accord with the aspirations of the new organization may be seen from the grant to the society of a yearly subvention to provide a headquarters with thoroughly qualified architects, who shall give opinions and prepare plans in connection with architectural improvements. It has favored recent legislation empowering the competent officials to forbid the placing of advertisements, such as painted signs, placards, pictures, or show cases where they are apt to disfigure streets, squares, buildings, or even the general appearance of the neighborhood.

The new law prescribes that the permission of the building police for the erection of buildings and for architectural alterations can be refused if, by the contemplated construction, another building in the vicinity, or a street, or the landscape is thereby disfigured. But this clause will not be applicable if, through the refusal of a license to build, the owner be placed at an exceptionally great disadvantage, or the cost to him, by complying with the law, be made appreciably greater.

By local regulations certain streets can be made to retain their historical or artistic character, so that the required permission of the police authorities for new buildings or architectural alterations may be refused when such construction may unfavorably influence the aspect of the neighborhood. Local regulations can also prescribe that the police license be withheld for changes on single buildings having historical or artistic importance, and also for alterations in the proximity of such old buildings if the latter may be at all unfavorably influenced by the proposed change. Decisions in cases connected with the local laws on granting or withholding of building licenses are subject to the hearing of building experts. Certain state authorities have the right in their various districts to require that local laws in reference to home protection be made. If such laws are not issued within a certain given time adequate regulations can be promulgated by the Ministry of the Interior, which shall remain in effect until the towns in question create suitable laws of their own. In instances where there may be harm in waiting for the enactment of local protective laws district governors are authorized to issue provisional regulations.

When an owner may be subjected to great disadvantage or to heavier expense by complying exactly with the regulations, permission to build may be granted if the character of the building will be in at least some harmony with its surroundings. In case of appeal to the competent authorities, not less than three experts are to be heard. All plans have to be submitted before license to build is granted, and if any subsequent changes are proposed further permission must be received. But the movement is general throughout the country for the construction of attractive houses in keeping with surrounding conditions. A short time ago a widely attended exhibition of plans was held in Plauen for model dwellings at a minimum cost for country and town. On account of the building laws and the habits of the people, most of the buildings here are made of masonry; few houses are built entirely of wood.

In the periodical maintained by the Saxon society, and devoted to subjects peculiar to the organization, one finds numbers of illustrations comparing artistic houses, public edifices, bridges, and even doorways and gateways with parallel instances of similar but disfiguring types. Interest is also manifested in the retention of old potteries, old interior decorations, and old styles of furniture as far as compatible with modern requirements and improvements. It is not enough, however, that these various things are old; they must have some artistic qualifications as well.

The application of the Canadian Freight Association for the cancellation of certain commodity rates on wire has been granted, except that carload rates from Hamilton, Windsor and Walkerville to points east of Toronto mentioned in the order be continued.

Building permits in Fort William for the months of January, February, March and April total $1,548,675, distributed as follows: January, $17,050; February, $315,625; March, $56,000; April, $1,160,000. This includes two elevators, one church and one business block.

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Trade Statistics Indicate Returning Prosperity

In spite of the fact that Canada's foreign trade for the fiscal year ending March 31st, 1909, was less by $78,744,340 than that of 1908, and by $52,945,400 than that of 1907, a certain measure of comfort may be taken from the statistics which have just been issued by the Dominion Government, inasmuch as they show that in all probability the turn of the tide has set in and the country's trade is on the increase. For the month of March, 1909, Canada's total foreign trade amounted to $53,171,277, which was an increase of $4,546,960 over that of the corresponding month of 1908. The increase in exports for March, 1909, amounted to $3,811,130, the total being $33,863,362. The increase in imports for March, 1909, over the same month of 1908 was $735,830, the total being $19,307,915. The increase in exports for March, 1909, was therefore 12.6 per cent. and the increase in imports was 3.9 per cent. Accordingly, the increase in exports was three and a quarter times as great as the increase in imports, a condition of affairs which should be regarded as satisfactory by all who wish to see an improvement in Canadian trade conditions.

For the fiscal year ending March 31st, 1909, the exports decreased by $18,494,447, the total being $261,512,159. The imports during the year decreased by $60,249,893, the total being $298,123,792. The decrease in exports for the year was therefore 7 per cent., and the decrease in imports 20 per cent. These figures demonstrate pretty clearly that during the period of depression Canadian purchasers kept up their sales to foreign markets fairly well to reduce the amount of their purchases abroad. They also demonstrate that as soon as the depression commenced to pass away Canadian purchasers began to increase their sales abroad. The result is encouraging to Canadian manufacturers and purchasers.

The market conditions in regard to the lumber industry afford a good basis upon which to estimate the general condition perfectly in other lines of business. Lumber is a staple building product which is quick to feel any depressing influence and which returns to normal conditions at a conservative rate. The total value of exports of forest produce for the fiscal year ending March 31st, 1909, was $39,667,387, against $44,170,470 in 1908 and $45,823,172 in 1907. There has thus been a decrease of $4,503,083 during the year just ended against a decrease of only $1,652,702 in the previous year. For the month of March, 1909, therefore, the total exports of forest products was valued at $2,761,307, as compared with $2,112,607 in March, 1908, being an increase of $648,700, or 30.7 per cent.

It would be foolish to conclude absolutely that these figures for March, 1909, indicate an immediate return of normal conditions of trade. Those who are engaged in the lumber business are far from satisfied with the present conditions. Their business is uncertain and fluctuating, and although most of them are counting upon an early resumption of activity they are continuing the conservative business methods which have been compulsory during the past year. It seems pretty safe, however, to conclude that with the continuance of these conservative methods the lumber industry, and likewise other industries, particularly those which have to do with the production of building materials, will from this time forward gradually return to a satisfactory situation.

Do Not Neglect Details

During rush times cases are not infrequent where contractors hurry their work and unintentionally neglect seemingly unimportant details, but which might spoil the entire effect. It is easy to forget, in such contingencies, that little things are necessary to bind the structure into a perfect whole, and that this might result in the ruination of the entire building.

It is always wise to remember that this is not the last house which the contractor wishes to build and that the quality of work performed may have a direct bearing on future contracts. When building houses, a contractor usually builds his reputation at the same time, and his future success more than likely depends upon his present achievement.

The building permits issued at Ottawa, Ont., last month amounted to $628,075, compared with $242,000 for the corresponding month of last year. The total for the present month will doubtless be a large one from the fact that one of the first permits, that for the Chateau Laurier Hotel, eclipses the total for May by more than a quarter of a million.

June 9, 1909

The Relation of the Engineer to the Community

An Outline of Present Conditions and Future Possibilities, by Cecil B. Smith, C.E., Toronto

The proceedings of the Undergraduates' Society of Applied Science of McGill University, Montreal, for the session of 1908-1909 have been issued in booklet form by the society, the articles composing the proceedings being reprinted from the "Canadian Engineer." The proceedings include a number of excellent addresses, by Cecil B. Smith, Robert T. H. Sailman, Otto Klotz, LL.D., Will F. McKnight, Charles E. Lucke and John W. McLeod. The booklet is attractively prepared, and contains a number of interesting illustrations. The address by Mr. Cecil B. Smith, which was upon the subject of "The Relation of the Engineer to the Community," was unusually forcible and valuable, inasmuch as it laid much stress upon the necessity for a wider acquirement of culture and business leadership by young engineers. The ideas developed by Mr. Smith will repay close attention, and we are pleased to be able to reproduce them. Mr. Smith said in part:

My object in addressing you is to suggest a permanent attitude of your mind and life, such that you, personally and individually, will, by your force of character and training, become vital facts in your own communities, and exert such an influence that the profession as a whole will receive an uplift.

The Need for Educating Public Opinion

In order to develop the idea it is necessary to outline the present condition, which is reflected by the newspaper, catering to public opinion. Much as one may resent it, deem it unjust, or otherwise dissent, still it must be admitted that, in the public mind, the term "engineeer" is still vague, and from the man who fires a threshing engine to the cultured physicist, there is a gradual merging of duties, opinions, values, and relation to the public, that the profession in vain struggles to free itself from.

To some, an engineer is a mechanic, a hardy explorer, whilst learning and technique are often discounted by the suggestion of lack of "practical qualities," which is seldom or never suggested by the public in its attitude of mind toward the other learned professions.

The profession has attempted, but in vain, to establish a close corporation. The prejudice of the legislators against so-called class legislation has so far prevented this laudable object from being consummated, and the public has no protection against the glorified mechanic or the glib-tongued fakir. It, therefore, rests with the young men of the present generation to educate public opinion, so as to bring about a change of view, to stamp on the public mind not only the value of the engineer in taming the wilds and coaxing the electrical current along distant routes, but to vindicate his far greater value as a leader of business, of affairs, of projects, and of the public mind itself, in those ever-widening channels of transportation, heavy manufactures, mining, and the construction, maintenance, and more particularly even the management of public utilities.

To demonstrate the newspaper man's treatment of the profession, I exhibit clippings from four Toronto dailies, in which a quarter column is considered the value to the public of a report of a banquet and speeches of the Canadian Society of Civil Engineers held recently. At this banquet the leading engineers of Canada were present in large numbers. The gathering was representative, and yet, the only paper giving more than a skeleton reference was one whose editor spoke at the banquet, and his speech, given in his usual perfervid style, bulks largely in the report. On the same date and in the same issues is given the speech of a Toronto lawyer in Buffalo on the exhilarating subject of the Judicial Committee of the Privy Council; and yet, four and one-half columns of fine print is the value placed on the speech. Several conclusions may be reached: that the lawyer was of known eloquence, that the engineers were poor speakers and had no specific message to give to the public; but I consider that the real reason lies deeper, and that it is because the public mind has long been primed with the idea that the engineer is only and solely an engineer and a servant, not a leader; a voter, but not a moulder of public opinion; a bird of passage, who, must unfortunately, often be engaged at a small salary or for small fees to design and carry out public works, utilities, that have been conceived, financed and handled by other and so-called broader minds, and the management of which will revert to the non-technical man so soon as the constructive period has passed.

The exception proves the rule, and, much as we may inveigh against it, and amongst ourselves discuss the mistake which the public is making in placing so narrow an interpretation on the engineer; yet the broad facts are as stated, and the remedy lies with ourselves and ourselves only; for the world accepts people at their own valuation.

As a starting point, I would suggest that the generic cause lies in the trend of mind given to the technically trained engineer at the university, where we find that the student, outside of a thin veneer of cultural training, is crammed full of theory and detail, but seldom with the proper method of presenting an idea, and such a deficiency is often perpetuated by the ever-increasing technical duties which are placed on the young engineer immediately after graduation, whereby in a drafting-room or in field work his mind is crystallized into silent routine.

Class Oratory and Leadership in Early Training

My suggestion as regards this is that more attention should be paid to culture studies, to class oratory and student literary and technical societies, where the young man should be encouraged, nay, obligated to acquire facility, terseness, and lucidity in presenting his case to his fellowmen, taught to think on his feet, to argue with calmness and control of temper, and develop a habit of temporary leadership.

Going beyond this, the graduate often fails to acquire business habits in college, and may miss the chance for many years afterwards, owing to his location or to his wandering habits, wherein he endeavors to broaden his experience and acquire business connections, but in doing so he loses what will be of far more value to him and to the profession, namely, the community standing.

From the moment a young lawyer or doctor graduates he instinctively locates and commences to acquire friends. In church circles he is in evidence, in sports, in society, in business, a factor to be counted with, and by imperceptible degrees the community feels that his opinion, his friendship, and his leadership are worth while.

The present condition of engineering in Canada is partly due to our scattered population, and we may hope for better things as the conditions of life become more complex, wherein greater numbers of the engineers are required in each community and wherein the very complexity of life must force the public to rely more on the skill of the engineer.

But each of you may do much to hasten matters by a clearer view of your opportunities—I consider the remedy to lie in creating in the public mind a new idea of the profession. This may be done in many ways: Each of you should loyally support Canadian engineering journals and societies, and contribute freely to them. This is more opportune in your younger days than in later life, for if successful you may soon find that an accumulation of cares and interests may make this more difficult.

Engineers Should Be Active Citizens.

Then you may achieve local standing by active participation in local matters Aloofness is never impressive for any length of time, and the man, however clever, who holds himself apart from every-day affairs is soon forgotten.

Therefore, participate in activities quite apart from your profession. I cannot see any valid reason why engineers should not be aldermen, mayors, and members of Parliament as the opportunity presents itself. But this will only come if the engineer is an active citizen, who does not aggressively put forward his views as an engineer, but as a citizen, who makes use of his trained mind to lead his fellowmen.

Speaking again as a business men to you: How many engineers are such? How many can dictate letters clearly, draft attractive reports? Organize any affair, however simple? Present the case to his fellows as a business man? Convince them by his clearness of expression, argument and vision?

Concerning Vision and Initiative.

This leads, naturally, to another point of view, namely, vision and initiative, in which our outlook here in Canada should be of the brightest.

It is not my intention to disturb your minds by suggesting that you should aim to be promoters or speculators. This should merely be a remote contingency arising out of long experience and opportunity, but your mind should be trained to be in a receptive mood.

This may come naturally by your association in this wise: Every enterprise has its value, its merits, demerits, limitations, and relation to the public and to the nation, and no matter how humble may be your first position, if it be to run levels or trace a plan, you should find out what it is for. If a railway, what are the objectives, what products will it benefit? What are its revenues and cost, and wherein does it benefit the nation?

If a patent, what industries will it affect? If an electric utility, the investment, the quality, the revenue, the reasons for the types used. The cultivation of such lines of thought will fit you to judge the merits of a subsequent and perhaps similar project, and by degrees you will arrive at a point wherein your vision may be true in perspective and your initiative ready to take wing.

When to such a training you can couple a cultured mind and a sound judgment, leadership should follow as a natural consequence, and I can easily imagine that if the younger generation of our profession should develop along such lines that a more dignified tone will gradually assume such proportions and the mind of the public will be so moulded that a higher status will surely follow.

Competition for Architectural Students

Designs for a Moderate Cost House

Architectural students are reminded of the competition inaugurated by this journal for designs for a $2,500 suburban or town residence. The drawings are to be sent to the Editor not later than June 31 next, and are to be signed by a "nom de plume" and accompanied by an envelope containing the student's name, address and nom-de-plume, on one sheet of paper. For the benefit of any who may not have seen the original announcement, the details are appended:

The competition will be open to all Canadian students in architecture.

Three prizes of $20, $15 and $10 will be given.

The following members of the Ontario Association of Architects will act as judges: Messrs. H. B. Gordon, of Gordon & Helliwell, Toronto; James Gemmell, of Smith & Gemmell, Toronto, and H. Sproatt, of Sproatt & Rolph, Toronto.

Designs are to be for a suburban, town or small city residence, to cost $2,500, on a permanent foundation, the lot to be 50 x 150 feet. A house with an extended front will be preferred rather than a deep one. The building is to be kept back from the roadway 50 feet, and path, grass or garden are to be shown in front and vegetable garden, shrubs or fruit trees plotted out.

The accommodation is to be as follows:

First floor:—

Living room	12 x 18 square feet.
Study	8 x 12 square feet.
Kitchen	12 x 10 square feet.
Entrance hall, stairs, vestibule and coat room, pantry and verandah.	

Second floor:—

Bathroom and three bedrooms.

The materials of construction are to be concrete for the cellar, and wood boarded frame, finished with shingles, clapboard or plaster.

The designs are to be drawn to scale of ⅛-inch and to include three plans and two elevations, also perspective if desired, but not obligatory.

Drawings are to be in black ink only, on white paper —walls blacked in. Elevations may be shaded in brush or pen work.

The decision of the judges will be published as soon as possible after the close of the competition.

The drawings are to be the property of the "Contract Record," which is to be at liberty to reproduce those which it desires to publish.

Canadian City Engineers

Lieut.-Col. H. N. Ruttan, City Engineer of Winnipeg, Man., began his professional career in the engineering department of the Grand Trunk, under Mr. E. P. Hannaford, chief engineer. When the construction of the Intercolonial Railway was begun, under Sir Sandford Fleming, he was employed as a junior on location surveys, and afterwards on the construction of that portion of the line along the Baie Chaleur in New Brunswick, where he remained till the completion of the work. Here he obtained his first contracting experience as manager of construction on section 6, when this work was given up by the contractors and finished by the Government. In charge of a party under Mr. T. Jefferson Thompson, in 1875, he made the first survey for the Canadian Pacific Railway along the north shore of Lake Superior, from the Pic to the Nipigon river. In the following year, he was placed in charge of a party on the Canadian Pacific Railway surveys between Edmonton and the Yellowhead Pass. He spent nearly two years in preliminary and location work in this district.

Lieut-Col. H. N. Ruttan, City Engineer of Winnipeg.

In 1877, on account of his experience in construction, and on the recommendation of Sir Sandford Fleming, he was employed by Mr. Joseph Whitehead as contractor's engineer for contract 15 between Cross lake and Rat Portage, remaining until practically the completion of the work, in 1880. On this work, as contractor's engineer, he was in charge of the engineering and construction cost departments. In 1880, he took up his residence in Winnipeg, and entered into business on his own account as engineer and contractor.

It was in this capacity that, between 1880 and 1883, he built the present Canadian Northern line between Portage la Prairie and Gladstone, and, as contractor, the C.P.R. Southwestern between Winnipeg and Carman.

From 1883 to 1885, Colonel Ruttan devoted most of his time to the study of municipal engineering problems in the United States. In 1885, he was appointed City Engineer of Winnipeg, which was then a city of about 16,000 people. The population is now estimated at 140,000.

The public works at Winnipeg are of the most modern design and construction. The expenditure required to keep pace with necessary improvements now amounts to over two millions of dollars anually. Among the municipal works constructed by the Engineer's Department, the most important are the high pressure fire service water works, having a capacity of 9,000 Imperial gallons per minute at a pressure of 300 pounds per square inch, a distribution system of seven miles in the business district, and the ordinary waterworks system, the supply for which is obtained from artesian wells from 50 to 100 feet deep, and 15 feet in diameter, the best of which has a yield of five million gallons per day. City Engineer Ruttan is a member of the board of consulting engineers for the hydro-electric plant being constructed by the city of Winnipeg on the Winnipeg river. Wm. Kennedy, Jr., and Prof. Louis Herdt, of Montreal, are the other members, and Mr. C. B. Smith is the chief engineer.

That Winnipeg's city engineer believes in the interchange of ideas and in the general principles of friendly co-operation, may be safely assumed from the fact that he is a member of the following institutions and societies: Canadian Society of Civil Engineers, Canada; Institution of Civil Engineers, Great Britain; American Society of Civil Engineers, United States; American Water Works Association, United States; American Society Municipal Improvements, United States; Concrete Institute, Great Britain. In addition, he is an honorary member of the Manitoba Society of Architects, Canada. This year he is one of the vice-presidents of the Canadian Society of Civil Engineers—in the organization of which society he took a prominent part as one of the charter members—and is also chairman of the Winnipeg branch of the same society.

There are few, if any, acting city engineers in the country who have a longer or a finer military record than City Engineer Ruttan, who has been a member of the militia force, 40th and 90th Regiments, for over 30 years. He served in the North-West campaign as a captain in the 90th, which regiment he commanded from 1895 to 1900, when he was placed in the reserve of officers. The colonel has the following decorations: Fenian Raid medal, North-West medal and clasps, and the long service decoration.

Lieut.-Col. Ruttan is a worthy citizen of no mean city. During the quarter of a century that he has held office he has seen some wonderful changes and abnormal developments in Winnipeg, and throughout them all, and in face of them all, he has risen to every occasion and executed his various works ably and creditably.

Ancient Concrete Bridge

In the south of France is a concrete arch bridge known as the Pont du Gard, which was erected in the year 56 B.C. The concrete in this was not composed of crushed stone or other small aggregate of the variety now employed in concrete bridge work, but was of the old style, consisting of alternate layers of large and small stones, gravel, etc., and of cementitious materials. Vitruvius describes the materials and methods in use before the Christian era, and other writers, like Alberti in 1545, and Polladia in 1570, accurately describe the method which "the ancients" employed, "of using boards laid on edge and filling the space between with cement and all sorts of small and large stone mingled together."

Methods for Prevention of Dampness

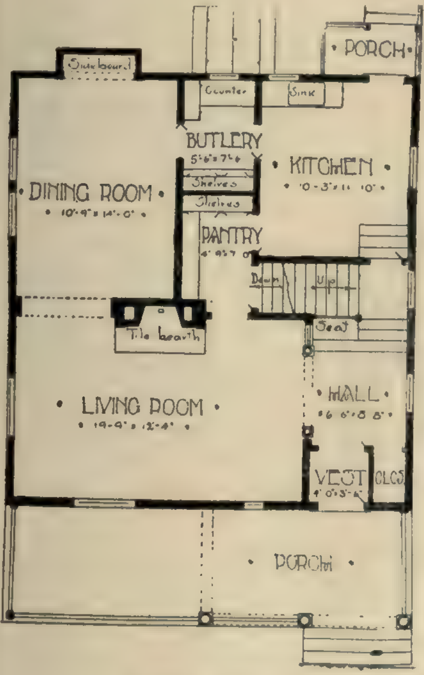
Several methods may be employed in preventing moisture from entering cellar walls, and two of the most important are: (1) application to the outside of the walls, and (2) constructive devices. The efficiency of the former depends greatly on the care and thoroughness with which they are applied. The coating must be not less than three-eighths of an inch thick, covering every joint, and must be carried down to the bottom of the footings. These coatings should not stop with the face of the wall, but be carried entirely over the top.

Cement is an excellent protective covering when thoroughly applied. It is often fractured, however, by the settlement of the walls, and, being somewhat porous, suffers from the action of frost. In either case it has no further value as a protective. In order to lay it properly, all the beds and joints of the walls should be raked out at least one-half inch deep. The coating should not be less than one-half inch thick, and should, as far as possible, be applied all at one time. If it is necessary to make a joint it should be vertical, and not horizontal. The last precaution is not to fill in the earth against it until the cement has thoroughly set. A similar protective covering is made of a concrete or one-half lime mortar and one-half good cement, Portland preferred.

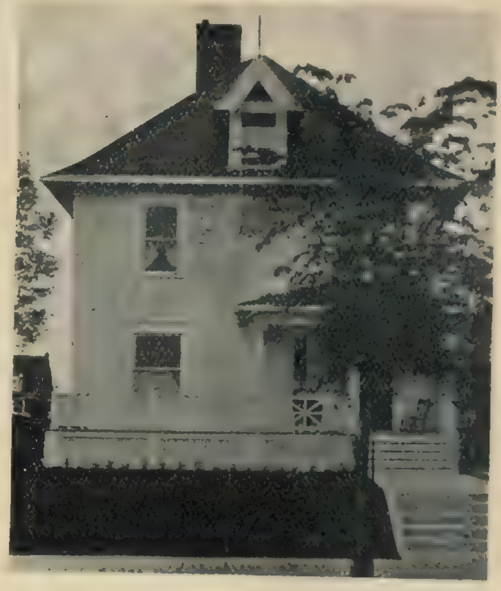
Of the constructive devices adopted to guard against dampness we have first those that are in the wall itself, and which comprise the horizontal damp courses, hollow brick lining and facing and hollow wall. There are several kinds of horizontal damp courses, which are placed at the bottom of the wall, either on top of the footings, or a short distance above them. That which is considered the most effective damp course is one of asphalt mortar, applied in coats. A great degree of efficiency is obtained by laying the course of bricks immediately over the damp course, while the last coat is still hot and soft. A layer of slate set in cement is often adopted as a damp course, but this is quite likely to be fractured by unforeseen pressure.

A House Built for Comfort and Convenience

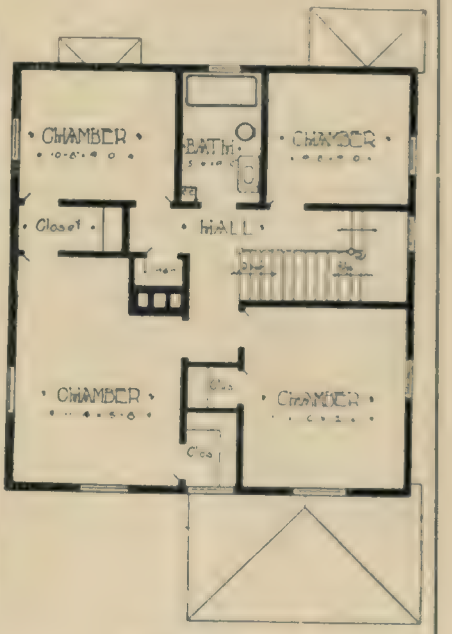
A home which is built for comfort and convenience fulfils all the requirements of the model home. The principal object to be obtained in the building of a home is to have it attractive without and properly arranged within. A home may be properly arranged from the standpoint of the builder, and yet lack that free, open air which makes it appear homelike. There is no waste room whatever in the hall of this house. Just room enough is given to answer the purposes of an entrance hall, and still not appear cramped or crowded. Just beside the vestibule is a coat closet. The stairway ascends to the second floor in the least space possible, and is a combination stair from both kitchen and front hall. The principal attraction on the first floor is, of course, the large living room, with its broad fire place, and pleasant outlooks in several directions. The house is very well supplied with pantries, having a large butler's pantry and kitchen pantry. On the second floor besides the bathroom, are four good-sized bed-rooms, each having a large closet, with a linen closet off the hall. The estimated cost of this house, not including heating and plumbing, is $2,500



Ground Floor.



Front Elevation.



First Floor.

Reinforced concrete is being largely used for bridges in New Zealand and some very fine examples of this class of construction are to be seen along the Oakura river, in Taranaki. One bridge in particular, in rib plate design, on abutments of reinforced concrete, carrying one span of 64 feet, with a width of 14 feet 8 inches and a height of 28 feet, is considered one of the best bridges in the country.

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Heating a Modern Eight-Room Dwelling

by a Pressure System of Hot Water, and the Economy of such an Installation.

By P. W. Rathbun.

The accompanying plans show a convenient eight-room dwelling which was recently erected at a cost of $2,000. It is of frame construction with cement block cellar walls and concrete floor in the excavated part of the basement. The price given above does not include heating or plumbing. The heating will be taken up in this article.

Hot water heating has for many years been a problem on which numerous experts have worked to bring about efficiency and the construction of a first-class apparatus at a reasonable price. A few years ago there were several pressure apparatus put on the market to revolutionize hot water heating

Practically the entire public and prospective builders have been misled by theoretical writers, whose theories made a hot water heating system cost the party installing it a vast sum of money, more than was absolutely necessary, and which practically goes to the pipe manufacturer for large piping and to the wasting of an endless amount of physical exertion in cutting, threading, and assembling same, to overcome friction. By practical experiments and experience, the writer found that with pressure heating at eleven (11) pounds applied to the water in the system, either by the use of regulating valves or mercury appliances, the pipe areas can be safely reduced 50 per cent. and the radiation 15 per cent., with tappings from 60 per cent. to 80 per cent. smaller than are used with the old open tank system. Besides this, the water under this pressure can be run up as high as 240 degrees Fahr., without boiling, which gives such a system of hot water the efficiency of steam without any of the disadvantages of the latter. A pressure system as described above contains 25 to 30 per cent. less water than the ordinary hot water system. This reduction of water causes the plant to be very responsive to firing, thereby causing a quicker circulation than the old style water-logged sytem. The smaller quantity of water lightens the load on the boiler; the smaller piping contains less radiating surface than the large pipes of a common job, and also reduces the boiler load, which greatly increases its efficiency, and the capacity of the boiler, which remains the same as with the old system.

. This quickened flow of water over the heated plates of the boiler absorbs heat more rapidly from the fire, and delivers it quickly to the radiators, and the radiators, in turn, to the room; therefore, all around better results and a decided saving in fuel are accomplished.

The accompanying plans show a pressure of hot water heating designed by the author two years ago and redesigned for this residence. The mains, branches, and tappings are according to the following schedules This system is better adapted to the emergencies of all seasons than an open-tank system. This job has been operated during the winter months to the entire satisfaction of all concerned. There has been a practical saving in fuel with this system of from five to six tons of hard coal each winter. The economy and fuel saving is very simple, the system operating under a pressure of ten to twelve pounds, the radiation and pipe lines are reduced, the boiler remaining the same size, which causes a quicker and more rapid circulation of the water throughout the entire job. Therefore, on account of there being less water to heat, with a temperature of only 140 degrees at the boiler instead of 180 degrees with the old-style system, it required to obtain 70 degrees in all rooms, this will make a charge of fuel which should always be enough to fill the fire-pot of the boiler even with the firing door, last from three to four hours longer than with the water-logged system. When testing this job, it was found that a temperature difference between the flow leaving the boiler and the return entering the boiler, was only 4 degrees to 8 degrees, so it is evident that the consumption of but little fuel is required to again heat this water to its former degree of temperature.

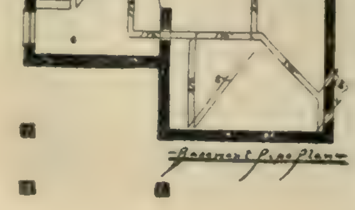
Table of Mains and Capacities.

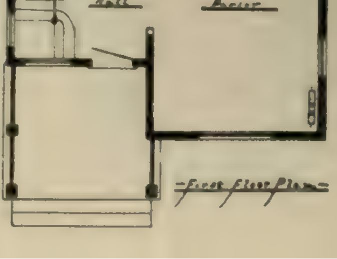
1¼	inch will supply	100	to	150	sq. ft. of radiation.
1½	inch will supply	150	to	200	sq. ft. of radiation.
	inch will supply	200	to	410	sq. ft. of radiation.
2½	inch will supply	400	to	600	sq. ft. of radiation.
3	inch will supply	600	to	1,000	sq. ft. of radiation.
3½	inch will supply	1,000	to	1,400	sq. ft. of radiation.
4	inch will supply	1,400	to	2,000	sq. ft. of radiation.

If the length of the mains are greater than 100 feet, increase them one size.

Radiator Tappings.

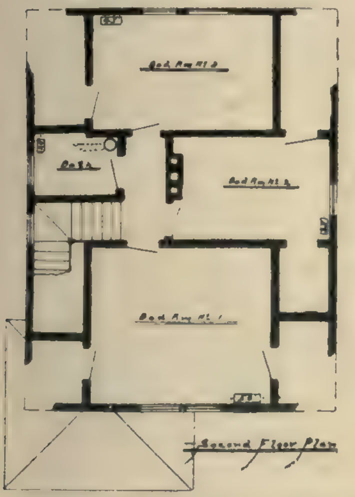
a. First floor, up to 25 square feet	½ in.
25 to 60 square feet	¾ in.
Over 60 square feet	1 in.
b. Second floor, up to 30 square feet	½ in.
30 to 100 square feet	¾ in.
Over 100 square feet	1 in.
c. Third floor, up to 50 feet	½ in.
50 to 125 square feet	¾ in.
Over 125 square feet	1 in.

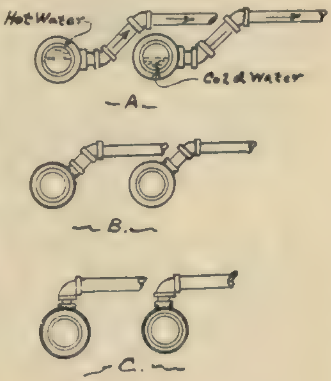




Use one size larger tappings for radiators at the extreme end of mains.

The following is a description of pipe connections: Instead of taking the branches off the mains with 45-degree ells, as is the practice with open tank systems, they are taken off in the manner shown in sketches A, B and C. When branches are taken from mains in the old style, the hottest water which always travels at the top of the main, will enter the first radiator branch. The second, third, and fourth radiators in turn get the next hottest water, and so on to the end of the main, leaving the last radiator to be supplied by the coolest water or rather that which has travelled on the bottom main all the way from the boiler. Where all branches are (45 e-d) taken from the top the mains must be one to two sizes larger than necessary in order to insure proper distribution of the water to all radiators and cause the last and those farthest from the boiler to receive their full share of hot water. When the branches are taken from the sides of the mains near the boiler in the manner shown in sketch "A" the result is quite different, the water in the flow main will not enter a branch until it has heated down in the main to a depth level with the top of the outlet or side of the tee.





Before the water is heated deep enough to enter the first branch or the ones nearest the boiler, it will have travelled a considerable distance up the main. As the water heats deeper, it will pass on and in turn enter the other branches. The hottest water, however, which is at the top of the main, will circulate to the last or end radiator, thus insuring good circulation in radiators farthest from the boilers.

It is evident by results produced in experience the author of this article has had in installation of pressure heating systems the past three years, that one can not put too much stress upon the fact that the old style hot water heating systems are water-logged. There being too large a quantity of water, it requires too long a time to heat and too much fuel to heat it, as well as too long a time to circulate the radiators. In the morning, nearly every one wishes warm rooms as quickly as possible. The readers of this article, who have hot water heating systems of the old style, are aware of one great difficulty which they experience in the way of heating the rooms in the morning. With the pressure systems and the one designed herewith in particular, an armful of shavings and a little wood has in seven minutes produced a temperature of 70 degrees in all the rooms.

We are aware that large bodies move slowly, so does the water in an old style large pipe system, and the circulation is comparatively sluggish, causing the plant to be inactive. Where pressure is produced by a regulating valve the risk run by the operator of the system is great. The writer has in mind at the present time one job which was installed by a valve, and after some months the valve stuck, and, upon the water rising to a boiling point, the valve refused to operate. The result was an explosion which blew out the entire side of the room, and carried the expansion tank some distance. With a mercury regulator, of which there are several patents on the market, there is practically no danger when creating a pressure upon the system, as these regulators are constructed with a standpipe extending from a bulb-shaped casting on the bottom to a similar-shaped casting on the top, and is constructed with brass tubes in this standpipe, so that the expansion of water from the system will cause a column of mercury to rise in the standpipe of the device to 21 inches, which automatically and positively seals the system from the atmosphere, as there are 5½ pounds of mercury in this regulator, and mercury being twice as heavy as water, there is a pressure of eleven pounds generated in an absolutely safe manner. As the water upon expanding rises, the mercury against a bottle plate in the top casting when an excessive pressure is created, the boiling water then passes around this plate and expands through the expansive line taken from the top of the same to the expansion tank, which is open to the atmosphere the same as the open tank system. This regulator has the ability to quickly and safely send the water temperature up to 240 degrees without boiling, which means all the difference between suffering and comfort one cold day.

The next important and most interesting thing to communicate to prospective builders of houses for paying investments is the fact that this system of heating as shown in plans, can be installed and operated for a much smaller amount of money than the old style open tank system, and will give better results.—National Builder.

The Advantages of Storing Water

Consul-General Robert J. Wynne, of London, transmits the following synopsis of a report made by Dr. A. C. Houston, director of water examinations, to the Metropolitan Water Board, of the British metropolis, on the advantages of storing water for some time previous to its filtration:

Storage reduces the number of bacteria of all sorts, and, if sufficiently prolonged, devitalizes the microbes of water-borne disease (typhoid bacillus and cholera vibrio). An adequately stored water is to be regarded as "safe."

The use of stored water enables a constant check to be maintained on the safety of London's water antecedent to and irrespective of filtration. It renders any accidental breakdown in the filtering arrangements much less serious.

The habitual use of stored water would lighten the grave responsibilities of the water board as regards the safety of the London water supply, and would tend to create a sense of security among those who watch over the health of the metropolis.

Raw river water should be stored antecedent to filtration preferably for 30 days. The question of whether the 30 days' storage should be fixed on a maximum or on a minimum basis must be left unanswered; but if the former alternative be chosen, the desirability of employing supplementary processes of water purification to tide over emergencies is worthy of consideration.

"When driving one nail," said the old carpenter, "think about how the next one should be driven."

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

The Durability and Cost of Various Paving Materials*

The primary object of a road or street is to provide a way for travel and the transportation of materials and produce from one place to another. The facility with which this traffic may be conducted between two objective points over any given road, depends upon the resistance offered to the passing of vehicles by the road surface or the grades, and also by the freedom of movement allowed—which is dependent on its width and form.

In order that a road may offer the least resistance to traffic, it should have as hard and smooth a surface as possible, at the same time affording a good foothold for horses, and should be so located or laid out as to give the least possible gradients.

The expediency of any proposed road construction or improvement depends upon its desirability as affecting the comfort, convenience and health of residents of the locality in which it is proposed to build it, and also upon its economic value, which is largely determined by its cost and durability as well as upon the facility it gives for the conduct of traffic. The problems of the highway engineer in designing works of this character involve the consideration of all these elements, and their proper adjustment, to give the best results.

The "road surfaces" most commonly employed are:

(a) Streets of cities and towns; Sheet asphalt, asphalt blocks, vitrified brick, creosoted wood block, stone block.

(b) Suburban streets, parks and private drives, where the nature of the sub-soil will permit it, and important country roads: Macadam, tar macadam, petrolithic, gravel, vitrified brick.

(c) Ordinary country roads: Earth or gravel.

The desirability of a road surface depends both upon its fitness for the service required of it and upon its durability in use. The problem of country road improvement consists ordinarily in providing the hardest and most durable surface consistent with an economical expenditure of available funds; the object being to lighten the cost of transportation by reducing the resistance to traction, and to render travel easy and comfortable. Other factors, however, are of much importance in the design of improvements to city streets.

The comfort, both of those using the street and of the occupants of adjoining property, will be largely affected by the freedom of the surface from noise and dust. The safety of the pavement in use, its effect upon the health of residents of the locality, and its economic value must in each case be considered.

Adjusting to the best advantage these various elements is a matter which can be accomplished only by the exercise of good judgment. Local conditions and necessities must always be considered—such as the difficulties of drainage, the availability of various materials, the nature of the traffic to be carried, and the needs of the business or property interests of the neighborhood. Thus, for the heavy hauling of a large city, durability and resistance to wear may be the paramount consideration; for the business district, quiet may be very important; in residential districts the elements of comfort and healthfulness may properly be considered as of greater force than the purely economical ones; while in all cases the necessary limitations of first cost will largely determine what may or may not be done.

Economic Value.

The chief factors to be considered in the proper determination of the economic value of any proposed street improvement are:—

First: Cost of construction.

Second: Cost of maintenance and repairs.

Third: Cost of conducting transportation.

Fourth: Effect upon land values or business interests.

The cash cost of a pavement is quite tangible and easily estimated. The advantages of a pavement cannot be directly estimated, and these advantages are often overlooked. It should not be assumed, however, that they have no financial value, nor should it be assumed that that pavement which may be constructed and maintained for the least money is necessarily the most economical to use.

The Cost of Maintenance and Repairs.

This includes an estimate of the average cost of keeping the pavement in good condition over a term of years, taking into account the necessity of renewing the surface at the expiration of the life of the pavement, the cost of cleaning and sprinkling, and such minor repairs as may be necessary from time to time to maintain a uniformly good surface.

The cost of maintenance of each kind of pavement varies widely in different localities according to the character of the construction and workmanship, and no general rules can be laid down as to the relative costs. All road surfaces will require maintenance, the same as any other class of engineering construction subject to wear in use; as a rule the cost of maintenance will be less according as the care used in keeping the surface always clean and in good condition is greater.

The Cost of Transportation.

This is affected by the nature and condition of the road over which the traffic must pass, both because the resistance to traction offered by the surface determines the load that may be hauled over it, and because the relative roughness or smoothness of the surface determines the limit of speed or traction, and the amount of wear upon horses, harness and vehicles.

That portion of the traffic which is confined to the hauling of maximum loads will be directly affected by differences in tractive resistances; the number of loads necessary to move the traffic being approximately proportional to the resistance. For light traffic, the greater speed incident to a smooth surface and easy grades will be of value as a time saver, although the saving may be difficult to state in dollars and cents. The effect of a smooth surface is very appreciable in the cost of wear and tear upon horses, vehicles and harness. The value of this item has been variously estimated at from one to ten cents per mile travelled.

Earth roads in good condition, and creosoted wood block pavements when dry, seem the most favorable to horses, while asphalt and brick pavements are considered most advantageous as to general wear. On earth roads in poor condition the wear is very severe, and on stone block pavements it is estimated that the wear is three or four times as great as on asphalt or brick. The value of the saving of this wear and tear is difficult to ascertain, but it is no doubt sufficient to make it an important item in the cost of highway transportation.

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*Read before the convention of the Iowa Brick and Tile Association by Paul Beer, Des Moines, Ia.

Land Values.

The effect of street improvements upon the value of adjacent property is dependent upon the nature of the uses to which the property may be put. The value of comfort, convenience, safety, and healthfulness to a community, as affected by the condition of its streets, cannot readily be stated in figures; but all these items have a money value, both in their effect upon the general life and business of the community, and in the attraction presented by them to outside business enterprises or homeseekers.

Hygienic Conditions.

The effect of a pavement upon the health of residents in its locality is dependent upon the tendency of the materials composing it to decay, its permeability, and its freedom from noise and dust. The permeability of a street surface is important because of the tendency of surface water and refuse matter to penetrate and saturate it, and thus cause it to become dangerous to health. A continuous sheet pavement is the most desirable in this respect, and a block pavement with open joints the least so. If the material of which the pavement is composed be permeable it may gradually become saturated with street refuse, even though the joints be made tight, and when it begins to decay may of itself become most obnoxious to health.

The chief objection raised to the use of wood block pavement is its permeability, for while the joints may be made practically tight and impervious, the wood itself will, in the course of three or four years, begin to lose its preservative oils, and it then becomes a receptacle for all the dirt and filth which falls upon it. The objection to a stone block pavement is that its joints cannot be made tight, and it is furthermore very difficult to keep clean, either by sweeping or flushing. Macadam pavement is also permeable, and therefore objectionable for use in city streets.

The noise made by traffic upon a pavement is important, not only because of its effect upon the comfort of the people using it, or living adjacent to it, but also because to it are frequently attributed many nervous disorders to which people in some cities are subject.

Stone block pavements are the most objectionable in this despect, causing a continual roar, due both to the rumbling of wheels over them and the blows of the horses' feet upon them. Upon asphalt, the only noise is that due to the horses' feet, giving a sharp, clicking sound. Upon wood the horses produce no appreciable sound, but the wheels of the vehicle give a dull rumble, generally considered the least objectionable of any of the noises made by the more common pavements. A brick surface gives a combination of the sounds of wood and asphalt, the clicking being much less sharp than on asphalt, and the rumble less noticeable than on wood. On any block pavement the noise is lessened in proportion as the foundation is made firm, and the joints close and well cemented.

The giving off of dust by a pavement under the action of traffic is also objectionable on the score of health as well as comfort All pavements produce more or less dust, the amount depending more upon the method of construction and the care used in forming the surface and filling the joints, than upon the material of the pavements. For the most part, however, the presence or lack of dust is dependent rather upon the maintenance, cleaning, sprinkling, and flushing of a pavement than upon its nature. The dirt on the surface of a hard pavement is usually carried there from the outside, and is not due to the pavement itself.

Earth and broken stone roads wear rapidly, and make dust freely in dry weather, requiring frequent sprinkling and cleaning to keep the road clear. On this account they are objectionable for use in towns under any considerable traffic.

Safety.

Another very important consideration in the construction of a pavement is its safety. The safety of a street surface depends upon the foothold afforded by it under normal conditions to horses, and also upon the degree of slipperiness that it may take both in wet weather, and under the influence of ice and snow in winter.

The relative safety of the various pavements used in city streets is a matter upon which there is considerable difference of opinion among authorities. Local conditions affect the pavement in this regard to an important degree. Relative dampness or dryness of climate. shade from buildings, cleanliness of the streets, and the prevalence of snow and ice in winter are all important factors for safety. It is conceded that a dry earth road in good condition gives the best and surest foothold, with broken stone and gravel road snearly as good, but the relative dryness or wetness of an earth road is entirely dependent upon the whims and fancies of nature, and the earth road is therefore a very uncertain quantity with which to deal.

Observations made by Capt. Greene in several American cities on granite block, creosoted wood block, and asphalt pavements show that asphalt under all conditions is the safest, while creosoted wood block is the most dangerous.

Wood block paving is very safe when dry, but exceedingly treacherous when wet, and positively dangerous in cold weather. Granite block paving is unsafe under all conditions. Asphalt paving is safe when dry and less dangerous than either of the other two pavements when wet. All hard pavements are slippery when muddy, and cleanliness is therefore a necesary condition to safety.

Under a light fall of snow both wood and asphalt become slippery, and in freezing weather wood becomes slippery through the freezing of the moisture retained by it.

No statistics were submitted by Capt. Greene as to the safety of brick pavements, but it is conceded by the best authorities to be the most satisfactory of all paving materials so far as safety is concerned, both in dry and wet weather.

It may be remarked in connection herewith that the likelihood of a horse falling upon any pavement depends very largely upon the training of the animal, and whether or not he be accustomed to the particular surface in question.

Durability of Various Surfaces.

The qualities which especially affect the durability of a pavement may be partially enumerated as follows:

(1) The hardness and toughness of the material composing the surface, upon which depends the resistance of the surface to the abrading action of horses' feet and vehicles passing over it.

(2) The firmness of the foundation, which serves to

distribute the loads over the road bed, and keep the surface uniform.

(3) The drainage of the road bed, which can only properly sustain the loads which come upon it when it is dry.

(4) The permeability of the surface, which should form a water-tight covering to serve in keeping the foundation and road bed dry.

(5) The resistance of the materials of the pavement to the disintegrating influences of the atmosphere, and to the action of the weather.

The relative importance of these various factors, in any particular case, depends largely upon the nature and extent of the traffic which is to pass over the pavement.

Granite block, when laid upon a firm, unyielding foundation, gives the hardest and most durable surface of any of the common pavements. This is especially true where the surface is subjected to the impact of very heavy loads.

Asphalt and brick rank next to stone, and when well constructed are satisfactory under any but the very heaviest traffic.

The relative durability under heavy traffic of brick and asphalt is a matter of doubt, both materials being subject to considerable variations in quality, and showing varying results in different localities, due both to differences in quality of material and to differences in the methods of construction.

Wood is less durable, and is suitable only for comparatively light traffic, unless its other advantages are considered worth the high cost of maintenance under heavy traffic, as has been the case in London, where wood has been largely used under traffic which has required its renewal every four or five years.

Broken stone macadam, under which head is also included petrolithic and bitulithic pavements, wears rapidly under moderately heavy traffic, and should be used only on suburban side streets, country roads, parks, and private drives—roads used principally for light driving. Even so, the maintenance cost of macadam is always very high, even under the most favorable conditions.

In considering the durability of a pavement it might be well to add here that while cleanliness is especially important so far as wood, asphalt or broken stone is concerned, vitrified brick or stone surfaces are not at all injured by neglect. It might also be well to add that the wear of a pavement also depends largely upon the smoothness of its surface; the impact to which the material is subjected is produced by irregularities, from which it follows that the most durable material does not necessarily give the greatest resistance to wear.

The major portion of the foregoing is from "Roads and Pavements," by Mr. Fred P. Spalding, M.A.S.C.E., Assistant Professor of Civil Engineering in Cornell University.

Summary.

We have now considered the desirability of pavements, their object, and the different kinds from which it is possible to make a choice. The question now arises: What character of street surface is most suitable for cities and towns having a population of less than one hundred thousand?

Stone blocks are to be avoided as a paving material, except for the heaviest traffic of our very large cities. There is little or no stone block paving in Iowa west of the Mississippi river towns, except at Council Bluffs, and because of the incessant noise and the wear and tear on horses and vehicles, and the unsightly appearance of the one stone block street in that city, it is soon to be resurfaced with asphalt.

A macadam street is quite out of the question in this Iowa country owing to the soft, spongy condition of the soil. Moreover, the sail has a clay base, and consequently is very unstable in wet weather. Even were the soil of such a nature as to permit the construction of macadam streets, there is no hard durable material within the borders of the State with which to build a first-class macadam pavement. In the Eastern States, where the ground is sandy, with a rock or slate foundation, and where good hard material may be easily and cheaply obtained for its proper construction, a macadam road serves most excellently; but even in the Eastern States, under the best of conditions, the maintenance cost of macadam roads is very high, as it is found that the automobile, which has come with us to stay, cuts into the road very badly.

Our choice therefore resolves itself between one of the three following permanent pavements:—

(1) Creosoted wood block.
(2) Asphalt.
(3) Vitrified brick.

During the past three or four years, creosoted wood block paving has been very strongly promoted in various parts of the United States. Many of the creosoted block streets which have been built have given eminent satisfaction, while many others have proved themselves absolutely worthless. The most satisfactory wood block streets are those constructed of "Long Leaf Yellow Pine," with a twenty-pound creosote treatment per cubic foot, the street itself being built in accordance with the best known methods of construction. Such a street will cost in the neighborhood of $5 per square yard and upward. Creosote block streets which have proved unsatisfactory are those where hemlock, tamarack, and Norway pine are used as a material. These woods are very soft and light in comparison with "Long Leaf Yellow Pine," and are far more resistant to the creosote treatment.

There are, therefore, the following objections to creosoted block as a paving material:

(1) Its high first cost .
(2) Its uncertain life.
(3) Its menace to health due to early decay.
(4) Its danger to man and beast when wet or freezing.

Asphalt is a very satisfactory pavement, many authorities considering it the most satisfactory of all pavements for those cities large enough to maintain a municipal asphalt plant; it would probably not be satisfactory for small towns. While it is true that it is a comparatively easy matter to repair an asphalt street, it is also true that if you do not have the means for making repairs you would probably find it an unsatisfactory pavement.

Brick Pavements.

A vitrified brick pavement is the cheapest of all pavements, and the most satisfactory, everything considered. It is durable, easy of traction, sanitary, clean and soft. Its first cost will depend on the foundation used, the character of the filler and workmanship. A vitrified brick pavement for a light traffic street, constructed in accordance with the No. 1 specification as adopted and recommended by the National Paving Brick Manufacturers' Association, should last from fifty to seventy-five years without the necessity of repair or replacement, provided the street be not torn up for service pipes, sewers, etc. A fair comparison of the first cost per yard of the three most satisfactory pavements follow:

Creosoted Wood Block	$3.00 to $5.50 per sq. yd.
Asphalt	2.15 to 2.40 per sq. yd.
Vitrified brick	1.36 to 2.00 per sq. yd.

LEGAL DEPARTMENT

Information for this Department is requested from Architects, Engineers, Contractors and Builders. Send in the particulars of recent cases in which you were interested, giving the main facts tersely.

Wrongful Use of Trade Name

As considerable interest has been taken in the case of the Standard Sanitary Manufacturing Company, of Pittsburg and Montreal, v. the Standard Ideal Company, of Port Hope, some extracts are here given from the judgment recently delivered by the Hon. Mr. Justice Archibald, of the Superior Court of Montreal. A similar case has been pending in the Ontario courts, but a stay of proceedings was granted pending the decision at Montreal It is understood that the defendants have served notice of appeal and the whole matter is likely to be threshed out in the Supreme Court of Canada. The following are some of Judge Archibald's comments:

"The proof in the cause is voluminous, but, nevertheless, gives rise to little doubt. The plaintiff has undoubtedly proved that, previous to its incorporation, the Standard Manufacturing Company had been engaged in the manufacture of porcelain baths and other toilet enamelled ware, such as above detailed, in the United States, under the name 'Standard,' and the word 'Standard,' applied to that class of ware, had come to be regarded as ware of the Standard Manufacturing Company; that the said Standard Manufacturing Company had established a branch of their business for the sale of that class of goods in the city of Montreal, and had installed a show-room where such goods could be seen for the purpose of purchase.

"The present manager of the defendant company, previous to 1902, was manager of a company in Detroit, in the United States, called the Ideal Manufacturing Company. As such manager of that company, he had dealings with the plaintiff company in the United States, knew the quality of their manufactures and the manner in which the same were offered to the public—names and labels and circulars which were used by the plaintiff company. The Ideal Company dealt to a certain extent at any rate, in a limited line of enamelled ware. The defendant's manager, about 1902, came to Canada, and interested the proprietors and stockholders of the defendant company in a business precisely similar to that which the plaintiff was doing in Canada. He originally called his company the Standard Ideal Sanitary Company, thus taking 'Standard' and 'Sanitary' from the plaintiff's name, and 'Ideal' from the name of the company in Detroit which he formerly managed. . . . The whole proof convinces me beyond question that the defendant intended to avail itself of the popularity and reputation of the plaintiff company, and while proof of actual 'passing-off' of the defendant's goods as those of the plaintiff, has not to any considerable extent been made, yet there can, I think, be no doubt that that has occurred in a large degree.

"I cannot doubt but that the manner in which the defendant has offered its goods to the public, advertised them—the similarity of the labels, similarity of combination in catalogue, the use of the word 'Standard,' were fitted to deceive the public, and are proved, in some instances, to have deceived the public. Nor can I doubt that such deception was the object kept in view by the defendant's manager. If, then, plaintiff has the right, either by the registration of the trademark or by the long use of the word 'Standard' as a trade-name, and has not lost that right in the way in which defendant suggests, plaintiff's demand for relief must be granted.

"My opinion is that the name of the defendant, and the name applied by the defendant to the goods of its manufacture, its label, its catalogues, are, all of them. of a nature to deceive the public, and to indicate that the goods which the defendant manufactures and sells are the goods of the plaintiff, and that, therefore, defendant's actions are properly called "passing-off" within the meaning of these words in connection with trademark cases.

"Plaintiff asks that defendant be restrained from the use of the word 'Standard' in connection with the sale of enamelled toilet ware. I have no doubt that plaintiff is entitled to that relief, and the judgment goes, enjoining the defendant from using the word 'Standard' or any word so similar thereto as to be likely to deceive in connection with such ware.

"With regard to the remedy which the plaintiff asks, viz., that the defendant be ordered to account, it does not appear to me that the circumstances could render that remedy effectual. The accounting will not be ordered. But plaintiff prays also for the sum of $5,000 of damages. It has been proved undoubtedly that some damages have been suffered. A peculiar matter is that a great number of architects were examined, all of whom had been in the habit of specifying the plaintiff's goods in connection with house-building in which they were employed. None of them had ever specified the defendant's goods, and yet the defendant's sales were growing in the city while the plaintiff's sales were diminishing. The defendant's goods were offered at a considerably lower price. There is much ground for belief the plaintiff's damages have been serious. Plaintiff, however, by his attorney in open court, at the rendering of the judgment, waived said damages, and the court accordingly did not grant them. Judgment will, therefore, go enjoining the defendant from the use of the word 'Standard,' with costs of suit as brought."

The following method of painting a cement wall was described at a recent convention of master painters. The building had become discolored in places, and the joints were of a different color from the surface of the blocks. Two parts of Portland cement were mixed with one part of marble dust and mixed with water to the consistency of thin paint or a thick whitewash. The wall must be well wetted before the application of this paint and kept constantly wet while the material is applied, and then must be kept for a day longer, in order to make the cement wash adhere to the cement surface. The wash was applied with ordinary whitewash or calcimine brushes, and a man was kept busy playing a hose on it while the work was being done. The whole secret of success lay in keeping the wall constantly wet.

Prof. A. B. Bleininger, ceramics expert of the U. S. Geological Survey, who will be remembered by those who attended the recent Clayworkers' Convention at Brantford, Ont., has accepted the position of director of the department of ceramics at the University of Illinois.

The Construction of Modern Sanitary Dwellings

Defects to be Avoided and Principles to be followed.—Practical Suggestions by Dr. Elzear Pelletier

(Continued from last issue.)

To allow the passage of sunlight and the renewal of air in the rear of houses, it is altogether evident that the buildings should not be extended to almost the rear limit of the lot. We indicate by the figs. 10 and 11 how, by imitating what is done in London, England, the necessary light and air circulation in the rear of houses can be harmonized with an almost complete utilization of the whole depth of the lot.

The air cannot renew itself to the level of the earth in yards, when on all sides these yards are surrounded by buildings, whose height everywhere exceeds fifteen feet. Only the upper stories will benefit by the partial (superficial) aeration of the yard; the lower stories are bathed by air that is not renewed, that is stagnant, upon which we cannot reckon for the complete, healthy aeration of the rooms facing it. Rey (1) has demonstrated this by sketches which we reproduce (fig. 12).

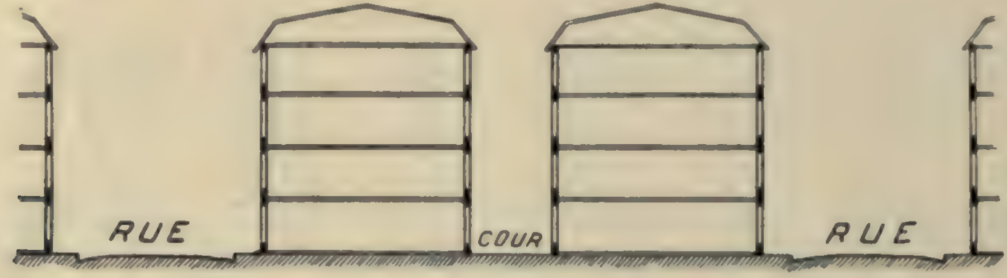


Fig. 10.—Windows opening into an unhealthy, narrow yard.

It is in the old quarters of our cities that the greater number of closed yards are met with. But to-day their number is increasing on account of the collective houses styled "apartments," (flats) in which for many, and often the most sumptuous, half the rooms have their windows opening on entirely closed yards.

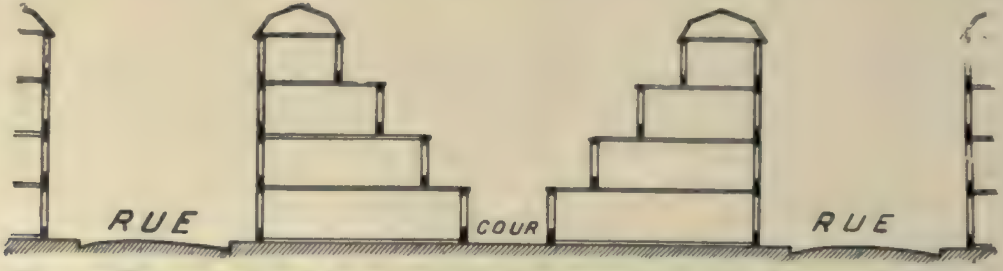


Fig. 11.—The same yard as in fig. 10, well lighted on account of the plan of construction adopted.

Rey, by two drawings which we reproduce (figs. 12 and 14), shows that it is possible to substitute an open yard for a closed one and still produce a building capable of lodging the same number of people. Indeed, it is shown (fig. 14) that the closed yard has been replaced by two yards widely opened towards the public highway, and maintaining a communication between their volume of air and the street air, which is always in motion.

After what has just been said of closed yards, it is useless to insist on the unhealthiness of "light (?) wells" which are the lowest type of closed yards. Fig. 15 shows that the sunlight only penetrates into them after numerous reflections. As to the renewal of air in such holes it is practically nil. Deal light and stagnant air are all that is left to rooms opening on these "dark light wells."

If we have so many dark rooms, and if tenants are found for the dwellings that contain them, it is due to two principal causes:

(a) The ignorance of the masses with regard to the most elementary hygiene. They ignore the fact that it is just as harmful to live in impure air as it is to drink polluted water or eat decayed food.

(b) Cupidity, which leads to inveterate speculation, even on human life. We shall prove, by two examples, that this expression is not too strong.

The same proprietor has built, in one of our cities, 84 flats on the plan represented in fig. 16, in which the only bedroom is an entirely dark room. The photograph of the facade shows, moreover, how little the proprietor cares for the lighting. Each dwelling is only eleven feet wide, and yet the half of the frontage of the ground floor dwelling is occupied by a wide stairway, allowing as sole lighting service for the lower flat, a half window and the glass in the front door. And why, when it would have been so easy to unite, into one, the two separate adjacent stairways shown in the photograph and thus reduce to two and one-half feet the hidden part of the frontage of the lower dwelling.

Another proprietor built an "apartment house" of an attractive external appearance (fig. 19), but the inner divisions are the most absurd that can be found. Rooms are "sandwiched" between two halls, thus creat-

(1) Rey, Paper read at the Geneva Congress, 1906.

ing dark rooms impossible to ventilate, in the dwellings occupying the interior part of the building. (See fig. 20.)

Can anything be attempted to bring about the abandonment of existing dark rooms, and at the same time baffle the proprietors, who are always wishing to build more of them on the ingenious pretext that they are only

(Continued on page 44.)

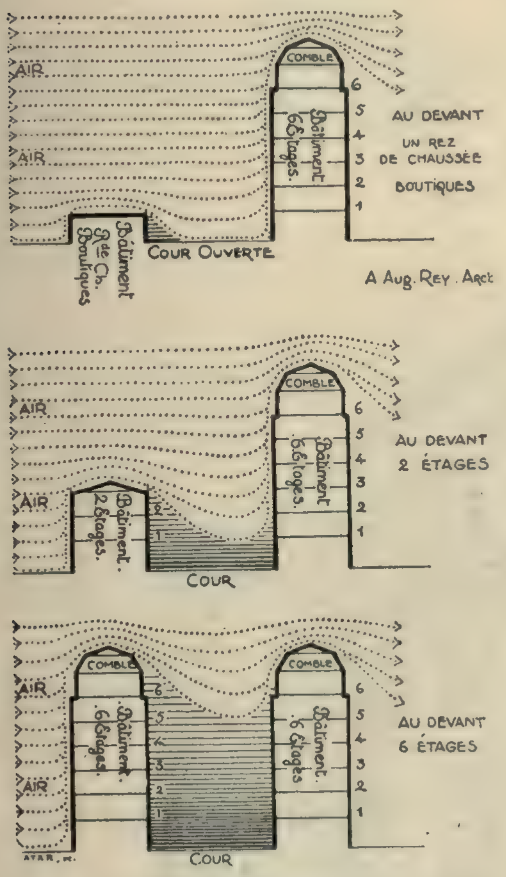


Fig. 12.—Showing the different effects of the wind upon the air in open and closed yards.

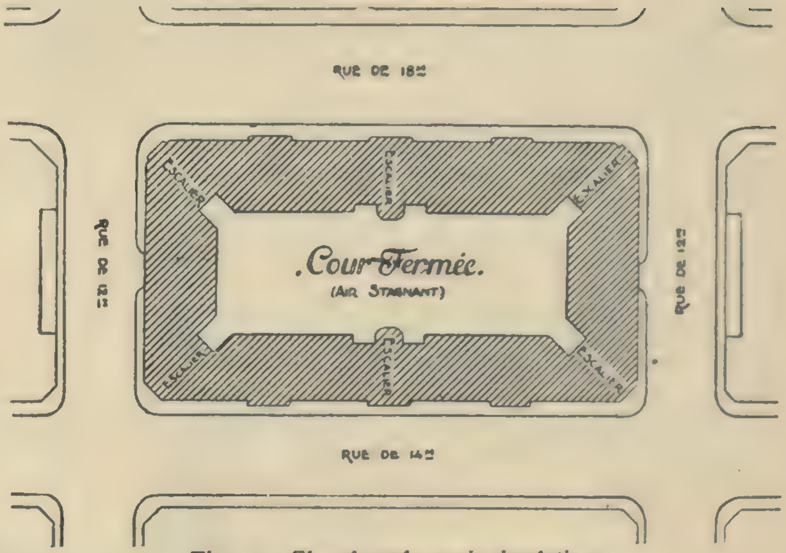


Fig. 13.—Closed yard, no air circulation.

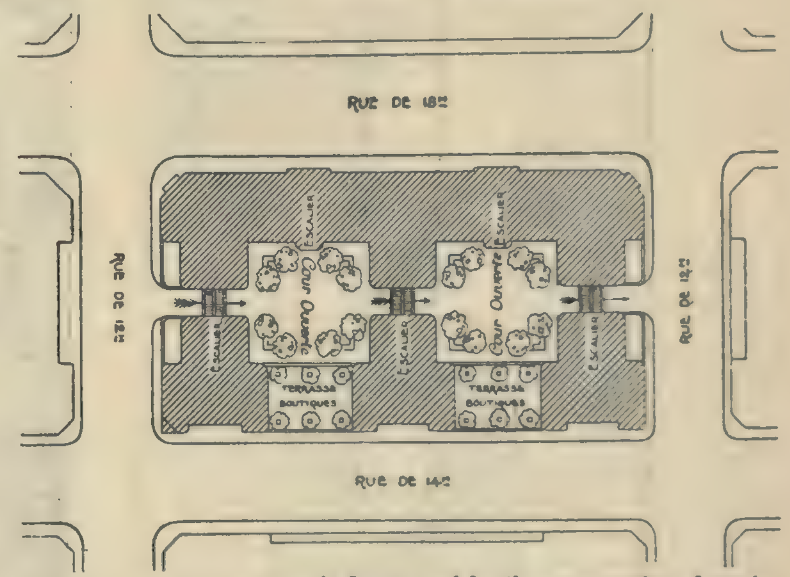


Fig. 14.—On the same lot as in fig. 13, and for the same number of people, a healthy building, open yards.

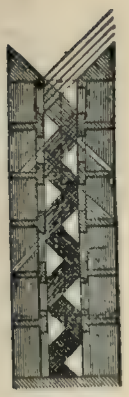


Fig. 15. Impossibility of securing sunshine with this "obscure light-well."

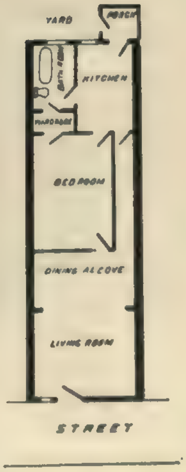


Fig. 16.

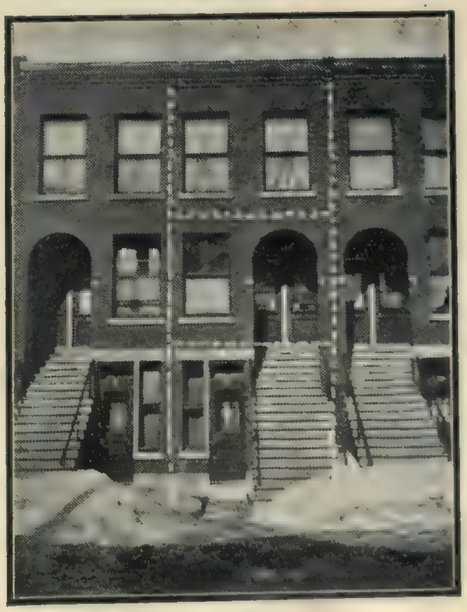


Fig. 17.

Figs. 16, 17 and 18.—Plan, street frontage and yard frontage of notoriously unhealthy dwellings. The dots indicate the space occupied by each dwelling.

"trunk rooms"? We believe so; by way of experiment we would propose to place upon the wall of any dark room, whatever its size (trunk rooms included), a notice which would read as follows:

"THIS ROOM HAVING NO WINDOW DIRECTLY OPENING INTO THE EXTERNAL AIR CANNOT BE USED FOR DAY OR NIGHT OCCUPATION. (Penalty of $ for whosoever removes or hides this notice) .... M. D., Medical Officer of Health."

The value of this placarding of dark rooms could be established as follows:

1. It will directly bring, wherever it will be immediately useful, the teaching of the harmfulness of dark rooms, which the anti-tuberculosis leagues, for instance, are striving so hard to spread. In other words, the notice will enlighten those who do not attend lectures on hygiene or anti-tuberculosis exhibitions.

2. A number of those who have been made wise by the notice will of themselves cease to occupy the dark rooms, without any more stringent intervention on the part of the sanitary authorities.

3. Perceiving that, on account of the notice, they can no longer pass off a dark room as a habitable room, the proprietors of renting houses will find it to their advantage to get rid of such rooms, so as not to depreciate their houses.

4. When it is known that dark rooms will be placarded as non-habitable, they will probably no longer appear in the plans of future structures, or, at least, the number of rooms which are now submitted to the musicipal sanitary authorities for approval on the pretence that they are only "trunk rooms," will decrease as by a charm.

5. Finally, the proprietor who continues to pretend that he only intends to build "trunk rooms" will be taken at his word, and, honest or not, he will only have to assent when the sanitary authorities will duly insert into the requested building permit, the words: "provided such rooms be placarded as non-habitable."

A stencil of this placard could be made, so as to paint it on a wall, and thus prevent it from being removed by the proprietor or the tenant.

(To be continued).

A Note upon Interior Decoration

With the use of plaster, or wood fibre wall boards, there can be had a very attractive room at a small cost, and as these materials can be cut with an ordinary knife there is no real difficulty encountered in their adoption. The panels can be nailed to this form of wall finish, and the effect is very satisfactory.

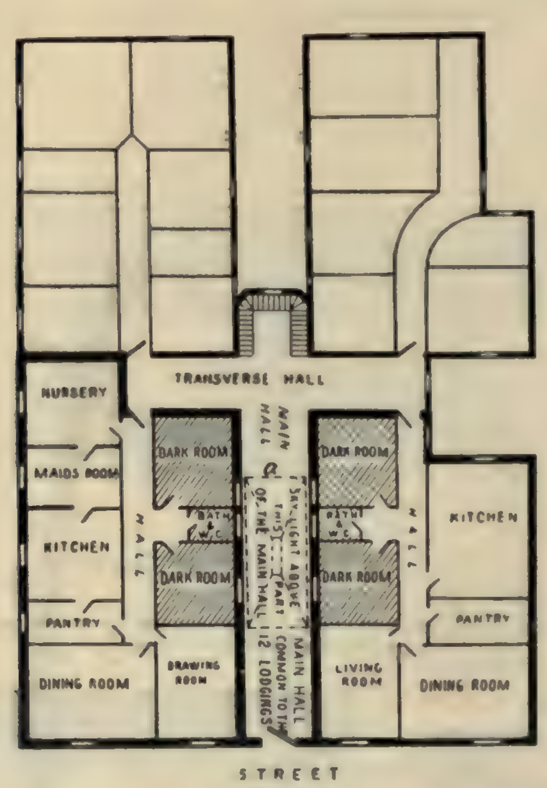


Fig. 19.

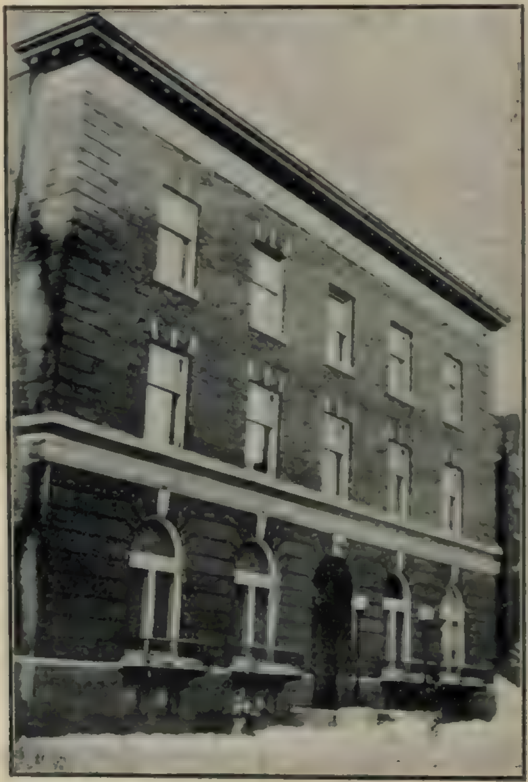
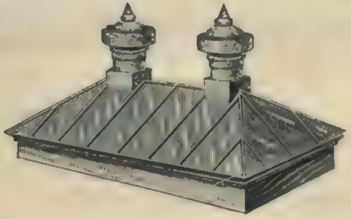


Fig. 20. Lower floor.

Apartment house for 12 families, 4 dwellings per storey. One third of each of the six dwellings, situated in the front part of the building, is composed of rooms the windows of which open on a hall, lighted by a skylight. Results: bad lighting and impossibility to air these rooms. the windows opening into the hall only producing an exchange of air between these different dwellings.

Much of our modern day taste is turning to mission and gothic styles in construction, and more particularly to the decoration of the interior of our homes, and the panelling effect somehow harmonizes to a great extent with this newer idea. It adds a certain dignity to the appearance of the abode, and at the same time gives it a homelike effect that is restful and comforting. It takes one back to the days when the "Knights were bold," and history was being made of he kind that we like to revel in. It makes the home more inviting, and there is likelihood of this idea becoming more prevalent in the future. The use of panels seems to be one of the features that will not be a fad, but one that will rather add to the comfort of our structures and give them more the appearance of what a home should in reality be for each of us.



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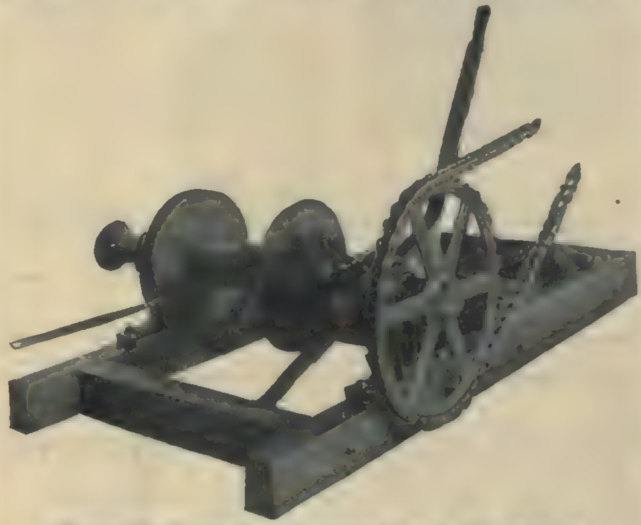

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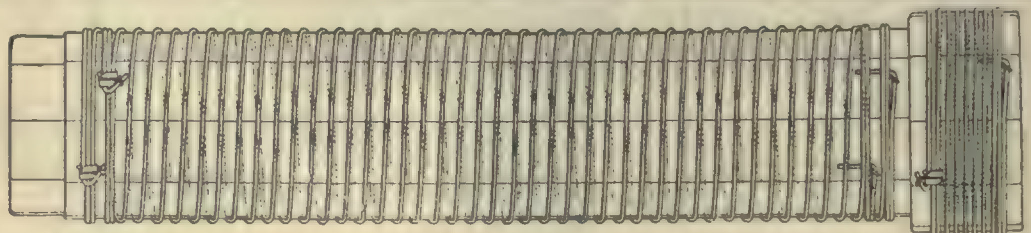

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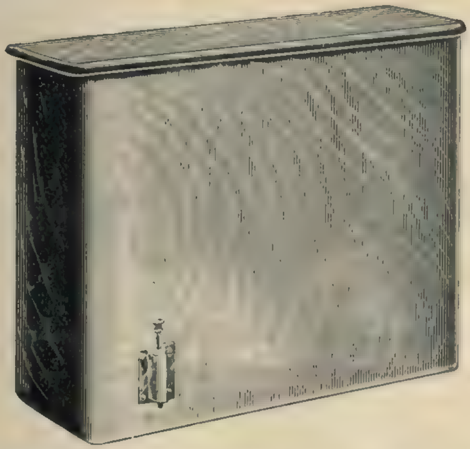

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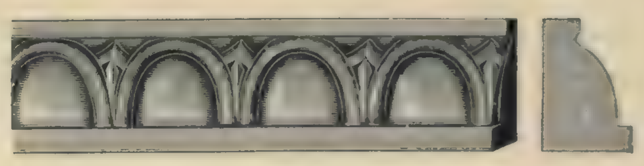

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Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Berlin, Ont.

The Board of Works have recommended the construction of a number of concrete walks.

Burlington, Ont.

Tenders close June 21st for a pump house, pumping machinery, steel pump well. O. T. Stringer, secretary. Willis Chipman, C.E., 103 Bay street, Toronto.

Chapleau, Ont.

Tenders will be received for sections of proposed water works system. (See advertisement.)

Cornwall, Ont.

Tenders will be received until June 19th for drain excavations. F. D. Brinet, township clerk, Moose Creek.

Clinton, Ont.

Tenders will be received until June 29th for the following sections of the proposed waterworks system: "A," labor pipe laying; "B," pump house; "C," water tower; "D," cast iron pipes; "E," hydrants, valves, etc.; "G," pumping machinery; "H," producer gas plant; "I," receiving basin. D. L. Macpherson, town clerk, Clinton. Willis Chipman, C.E., chief engineer, Toronto. (See advertisement.)

Fredericton, N.B.

Tenders addressed to A. K. Grimmer, city engineer, will be received until June 19th for the construction of 4,000 square yards of permanent pavement and 700 lineal feet of combined curb and gutter.

Kamloops, B.C.

The ratepayers may be asked to vote on a bylaw to raise $20,000 for waterworks extensions.

London, Ont.

The waterworks department have taken up a quantity of six-inch waterpipe said to have been ruined by electrolysis. The London Street Railway is expected to make good the damage.

Bylaws for the construction of nine miles of 18-inch and 12-inch water mains will be voted on by the ratepayers on July 26th.

Manitou, Man.

The town will expend $8,000 on granolithic walks. Tenders are wanted.

Montreal, Que.

Tenders for cement are invited by the Water Committee. George Janin, superintendent waterworks.

The City Council have voted $87,950 for new sidewalks.

The sum of $100,000 will be appropriated by the council of St. Louis for macadamizing the streets and for permanent sidewalks. Of this sum, $25,000 will be spent in each of the four wards under the direction of the Road Department.

The officials of the Royal Victoria Hospital have notified the city that they will no longer require the city's water service. The hospital will secure its supply from artesian wells, pumped into a reservoir with a capacity of 40,000 gallons.

North Toronto, Ont.

On July 17th the ratepayers will vote on a bylaw for the authorization of issuing debentures to the amount of $159,000, of which $131,000 will be for the laying of sewers on streets on which water mains are laid, and the erection of a sewage disposal plant, $8,000 for sewers on streets not yet supplied with water mains, and 20,000 for the opening up of a parallel street east of Yonge street.

Portage la Prairie, Man.

The City Clerk has intimated that it is the intention of the council to construct a number of granolithic walks in the immediate future.

Prince Albert, Sask.

The government have ceded Cole's Rapid's to the city and a dam and canal will be constructed. The cost will be close upon one million dollars.

Rockliffe, Ont.

The Gloucester Township council are considering the matter of raising $8,000 by debentures for the installation of a waterworks system in this village.

Strathroy, Ont.

Tenders addressed to R. Diprose, town clerk, will be received until June 24th for construction of granolithic sidewalks.

St. Catharines, Ont.

Additional sewers and flush tanks will be installed here shortly.

Toronto, Ont.

The City Engineer will shortly call for tenders for eight miles of water mains.

Tillbury, Ont.

The Town Council are securing estimates on paving Queen street with concrete macadam from the International hotel to Yonge street.

Victoria, B.C.

The Purchasing Agent has been instructed to call for tenders for paving Wharf street, from Johnston street to Government street, with vitrified brick.

Vancouver, B.C.

The Board of Works have adopted the scheme for the Mount Pleasant sewerage system. Estimated cost, $133,000. City Engineer Clement may be addressed.

A waterworks system will be installed on Lulu Island almost immediately. The work of laying mains will commence shortly.

At a recent meeting of the Board of Works, tenders were opened as follows for the block paving of Powell street from Westminster avenue to Victoria Drive:—M. P. Cotton, $150,354; Christian & Hartney, $154,987; Pacific Coast Construction Company, $157,209; Armstrong & Morrison, $167,740; Ironsides, Rannie & Campbell, $172,837; T. R. Nickson & Company, $150,900. The City Engineer will report. At this meeting the Board decided to call for tenders for the block paving of Westminster avenue from Dufferin street to Seventh avenue.

Westmount, Que.

The ratepayers will vote on a bylaw to raise $300,000 for permanent street improvements.

Walkerville, Ont.

Tenders are called for the construction of pavements and sidewalks. (See advertisement.)

Winnipeg, Man.

At a recent meeting of the Board of Control, it was decided to call for tenders for the construction of asphalt on the following streets: Portage, Maryland to city limits; Notre Dame, Nena to west line of D. G. S. 46; Academy road, Wellington crescent to Stafford; Kingsway, Stafford to Harrow; Harrow, Kingsway to Yale; Ruskin Row, Wardlow north to end of present pavement. The tenders for Portage avenue and Notre Dame pavements will be for full width, but only half will be done this year.

AWARDED

Brantford, Ont.

The Burford council have awarded the following contracts in connection with the Holt drain: Section 1, $54.50, E. Link & Bros.; section 2, $50, B. Holt; section 3, $40, W. H. Kipp; section 4, $46.80, John Crozier.

Carswell & Freeman have been awarded a contract for concrete curbs and gutters by the City Council.

Cobourg, Ont.

The contract for 5,000 feet of cement walks was awarded to the Forest City Paving Company, of London, Ont. Tenders were as follows:—Forest City Paving Company, London, Ont.—Sidewalks, 7 95-100 cents per square foot. James W. Cummings, Stirling, Ont.—Sidewalks, 10¼ cents square foot. J. E. Hayes, Peterboro, Ont.—Sidewalks, 9¾ cents square foot; crossings, 13½ cents, foot; extra curbing, 8 cents foot; extra filling., 75 cents foot. A. Curtis, Cobourg—Sidewalks, 11½ cents square foot; extra curbing, 4 cents a foot; extra filling, 75 cents a yard. D. W. Mitchell Construction Company, Niagara Falls, Ont.—Sidewalks, 9½ cents, square foot; crossings, 12½ cents a foot; extra curbing, 8 cents a foot; extra filling, 75 cents a yard. M. Jex & Company, Cobourg—Sidewalks,9 3-4 cents square foot; extra curbing, 8 cents a foot; extra filling, 75 cents a yard. Dolan & Son, Belleville, Ont.—Sidewalks, 9 3-4 cents a square foot; crossings, 11 1-2 cents a foot; extra curbing, 4 cents a foot; extra filling, 89 cents a yard. James Bogue, Peterborough—Sidewalks, 11 1-2 cents a square foot; crossings, 25 cents a foot; extra curbing, 11 cents a foot; extra filling, $1.25 a yard; tile, 25 cents a foot.

Nelson, B.C.
The City Council have accepted the offer of Mr. Gillett to supply 1,000 barrels of cement at $4, less 40 cents rebate for sacks.

Toronto, Ont.
The contract for the steam centrifugal pump for the filtration plant has been awarded to the J. McDougall Caledonian Iron Works, of Montreal, at $9,428.

Tenders for sections 4 and 5 of the trunk sewer were opened by the Board of Control last week. The contract was awarded to John Wagner, of Cleveland, the lowest tenderer, at $21.75 and $20.50 per lineal foot respectively. Section 4 will be laid on Adelaide street from Jarvis to Simcoe street, and will cost $91,589. Section 5 will extend from Simcoe street to Stanley Park, and will cost $132,860. Eight tenders were received, including one from the City Engineer, whose prices were $36.09 and $29.06 per foot. The work will be started as quickly as possible.

Yorkton, Sask.
The contract for the extension of the waterworks and sewage system has been awarded to the Western Construction Company, of Regina, at $16,032, the lowest tender received.

James Peat & Sons, of Petrolea, Ont., have been awarded a contract for boring a deep well in connection with the water supply. Contract prices: First 500 feet, $8 a foot, and $10 for every additional foot up to 1,000 feet.

Railroads, Bridges and Wharves

Arnprior, Ont.
Tenders will be received until July 3rd for a steel bridge with concrete piers and abutments. Macallum & McAllister, engineers, Continental Life Building, Toronto.

Clinton, Ont.
Tenders will be received for erection of a one span steel bridge, 115 feet in length, over the Bayfield river. (See advertisement.)

Calgary, Alta.
The Grand Trunk Pacific, the Canadian Northern and the Canadian Pacific have made applications to the government for the approval of their surveys of branches into Calgary and the applications will be passed upon by the Minister of Railways and Canals on June 18. The site for the union station in Calgary will also be disclosed when these applications are passed upon.

Dauphin, Man.
The C. N. R. has decided to build twelve more miles of the extension into the St. Rose country. Engineer Vassar is engaged on the work.

Fort William, Ont.
The Canadian Pacific Railway Company recently announced that they will expend $7,000,000 this year and next in Fort William, reclaiming land at the mouth of the Kam river, and building coal docks, freight sheds and traffic bridges.

Guelph, Ont.
Two new reinforced concrete bridges, one with a 22-foot span and the other 16-foot span by 30 feet wide were decided on at a recent meeting of the city council. Plans have been forwarded to the Provincial Department of Public Works.

Indian Head, Sask.
The rural municipal council intend to present a bylaw authorizing the building of cement bridges to replace the wooden ones.

Moncton, N.B.
Mr. J. T. Forbes, superintendent of bridges, has received orders from Chief Commissioner Morrissey for the following additional bridge work: Melanson bridge culvert, Boudreau Village, a new stone culvert; Sherman bridge, Salisbury, approaches, general repairs; the Gorge bridge, Moncton parish, on the road to Indian Mountain, general repairs; McQuarrie bridge, Cape Breton Settlement, parish of Moncton, general repairs; widening out of the Boundary Creek culvert and embankment and raising the height; the Douglas bridge approaches, parish of Salisbury, to be renewed.

Pink Rock, N.B.
Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until July 25th for the construction of wharf extension and breakwater at this place. Plans and specifications may be obtained at the Department at Ottawa; E. T. Shewen, resident engineer, St. John, N.B., and Geoffrey Stead, resident engineer, Chatham, N.B.

Toronto, Ont.
Tenders addressed to H. F. McNaughten, Secretary, Department of Public Works, will be received until June 24th for substructures and super-structures of various bridges. Plans and specifications at offices of the Department, and of W. E. Kerr, New Liskeard, Ont.; S. Cole, Thessalon, Ont., and H. N. Moss, Renfrew, Ont.

The Board of Control have decided that it will be cheaper to build a new steel bridge for street car traffic than to widen the present Dundas street bridge, but have deferred action until the City Engineer has reported upon the tenders.

City Engineer Rust has been instructed to make another report on the cost of filling in portions of the lagoons and building a new bridge at the Island to connect Hanlan's Point with the western sand bar.

The plans for the Wilton avenue bridge across the Don, for which $215,000 was voted last January, are about completed, and City Engineer Rust expects to call for tenders within a few weeks.

Vancouver, B.C.
The City Council have decided to erect a low level bridge across False Creek at Cambie street.

Victoria, B.C.
Improvements are to be made to the Victoria and Sydney Railway system. A handsome new brick depot with warehouses and freight yards is to be built on the corner of Blanchard and Fisquard streets.

Welland, Ont.
The town council will probably petition the Government to have another bridge built across the canal between Main street and the M. C. R.

Winnipeg, Man.
Tenders have closed for the construction of a branch line from Melville to Yorkton and the awards will be published shortly.

It is expected that contracts will be let shortly for a large number of new depots along the line of the G. T. P. west. There are also parties out on the line west of Edmonton preparing estimates for the tender on that stretch of the grade. This contract is also to be let shortly.

AWARDED.

Aylmer, Ont.
Tenders have been awarded by the town council for the new bridge at Myrtle street as follows: Cement work, C. C. Stafford; steel work, Stratford Bridge Company, Stratford, Ont.

Cornwall, Ont.
Eleven tenders were received by the Charlottenburg council for the construction of the abutments required for the new Beaudette and Island bridges, ten for the steel spans, with reinforced concrete flooring. The contract for spans was awarded to the Hamilton Bridge Work Company, and for the abutments to McDonald & Merpaw, of St. Andrews. Estimated cost, $6,000.

Portage la Prairie, Man.
C. P. Wright, of this place, has obtained the contract for grading twelve miles on the C. N. R. Greenway extension in Southern Manitoba.

Public Buildings, Churches, Schools, etc.

Alameda, Sask.
Architect W. Zimmerman has forwarded plans for the new Alameda Public School to the Winnipeg Builders' Exchange.

Birtle, Man.
A town hall, costing $3,500, will be erected.

Birnie, Man.
A new school and a church will be erected here.

Blenheim, Ont.
Tenders for repairs to school building, S. S. No. 10, Raleigh—painting, carpentry and cement work—are invited until July 1st by Jno. V. Millns, secretary-treasurer.

Brandon, Man.
A Methodist church, costing $30,000, is to be constructed at once.

Architect T. Sinclair, of this place, is calling for tenders for a brick Presbyterian church at Elva, and a school building for Dauphin.

Cache Bay, Ont.
Tenders for the erection of a lock-up at this place will be received until June 30th by Fred. Shroeder, clerk.

Chatham, Ont.
Tenders addressed to J. L. Wilson & Son will be received until June 19th for the erection of a school house building in Chatham township.

Dewberry, Alta.
A small brick veneer school will be built. T. H. Thomas is secretary.

Dresden, Ont.
The ratepayers have approved a by-law to raise $20,000 for the erection of a new school building.

Dauphin, Man.
The ratepayers have voted to expend $60,000 for the new school building.

Tenders were recently taken for four room addition and assembly hall to south school. W. S. Jackson, secretary, Dauphin, Man.

Edmonton, Alta.
The Ruthenians will build a $9,000 church in the Norwood district. Rev. N. Saitzeff is interested.

The following districts will build small schools: Josephburg, Lamerton, Longfellow, Brandland, Amisk Valley, Fordville, Tuichebray and Namaka.

Court houses are to be built by the province at Claresholm, Medicine Hat and Fort Saskatchewan.

Estevan, Sask.
The School Board has accepted plans for an 8-roomed school.

Tenders will be received until June 25 for the erection of a town hall. L. A. Duncan, secretary-treasurer.

Gull Lake, Sask.
The Gull Lake Development Company will have a town hall erected.

Halifax, N.S.
Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until June 30th for the construction of vault lining, vestibule lining and vault doors, and special vault at the Halifax post office. Plans and specifications may be seen at the Department at Ottawa and at the office of C. E. W. Dodwell, resident engineer, Halifax, N.S.

Ingersoll, Ont.
Tenders will be received for the erection of a public library. (See advertisement.)

Kelowna, B.C.
$8,000 will be provided by the provincial government for a new school on condition that the city contribute the balance of $25,000, the stipulated cost of the new building.

Kenora, Ont.
Tenders for I. O. O. F. block closed June 15th with Geo. A. Beatty.

Kamloops, B.C.
Tenders addressed to F. C. Gamble, Public Works Engineer, Victoria, B.C., will be received until June 17th for the erection of a frame school house at Monte Creek.

Tenders addressed to T. A, Shackleton, secretary, school trustees, will be received until June 18th for the work of finishing the assembly hall of the public school building.

Lindsay, Ont.
The Town Council is considering the question of improved school accomodation.

Lumsden, Sask.
Architect G. E. Hutchinson, of Regina, is preparing plans for the Lumsden hotel.

Medicine Hat, Alta.
Tenders were recently taken for brick and stone public school building. W. T. Williams, arcihtect, Medicine Hat, has the plans.

Melville, Sask.
The School Board have plans for a $15,000 brick school.

Moose Jaw, Sask.
Tenders for the new Imperial Bank are expected to be called soon.

Tenders were recently called for the new Anglican church to cost $35,000.

A Presbyterian college will be built here. A site has already been selected.

The Board of Trade want the early construction of a land titles biulding.

Tenders were recently taken for erection of a new Anglican church. Plans with Reilly & Clemesha, architects, Regina, or H. D. Pickett, Box 1111, Moose Jaw.

Montreal, Que.
The Y. M. C. A. have raised a considerable amount towards the sum required for the annex to the present building and the erection of a new branch in Westmount.

Plans for the extension of the Windsor street station to St. Antoine street have been completed. Estimated cost, $1,500,000.

Nelson, B.C.
A new building is to be erected for the Kootenay Lake general hospital at Nelson.

Nakusp, B.C.
Tenders addressed to F. C. Gamble, public works engineer, Victoria, B.C., will be received until June 30th for the erection of a three-cell lock-up and constable's quarters. Plans and specifications at offices of government agent at Kaslo; government agent, Revelstoke; mining recorder, Nakusp, and at the Department at Ottawa.

New Westminster, B.C.
Tenders addressed to F. C. Gamble, Public Works Engineer, Victoria, B.C., will be received until June 17th for the erection of a frame school house at Vedder Creek.

Ottawa, Ont.
The G. T. R. will shortly commence the construction of a station at South Indian, 22 miles east of Ottawa.

A new separate school building will be erected in Clarkstown. Plans will be prepared at once by M. C. Edey.
height.

Peterborough, Ont.
Tenders addressed to N. Tessier, Secretary, Department of Public Works, will be received until June 22nd for the interior fittings at the armory. Plans and specifications may be seen at the Department at Ottawa, and at the office of W. Blackwell, architect, this city.

Raymond, Alta.
A 12-room brick school is to be put up, costing $20,000. George W. Green is secretary.

The Board of Trustees of the Church School will have a 2-storey brick building erected at a cost of $40,000.

Chisholm & Son, architects, are preparing plans for a new building for the I. O. O. F. Estimated cost, $40,000.

Revelstoke, B.C.
The Board of Trustees further considered the question of a new school. Plans were approved and the completed specifications are expected in a few days.

The plans for the new divisional schools for which the trustees will ask the sum of $40,000, show a building with concrete foundation, superstructure of brick, 55 by 112 feet in dimensions and two storeys in

Rocanville, Sask.
Plans have been completed for a new Methodist church, 38 by 48 feet.

Swift Current, Sask.
A site for a new fire hall has been bought.

Sackville, Ont.
It has been decided to proceed at once with the erection of a new ladies' college at Mount Allison.

Strathcona, Alta.
Tenders are wanted for new town hall, 40 x 60 feet, four storeys. Wilson & Herrald, architects.

St. Boniface, Man.
A scheme of improvement entailing the erection of a handsome tower on the city hall was recommended to the St. Boniface council. The tower was designed by V. W. Horwood, the Winnipeg architect, and will add fifty feet to the height of the municipal building.

Stratford, Ont.
The ratepayers will vote on a bylaw to raise $15,000 by debentures for the enlargement of the general hospital.

St. John, N.B.
The congregation of Victoria Street Baptist Church have set aside the project of enlarging their building with a view to erecting a new structure later on.

Selkirk, Man.
Plans for the new $100,000 provincial asylum are ready and tenders will be called shortly. S. Hooper, architect. Brick construtcion, three storeys, 95 x 152 feet.

Saskatoon, Sask.
W. P. Bate, secretary, is getting plans for a $90,000 collegiate institute.

Bishop Newman says the Anglican church will erect a preparatory school or college here next to the new university. The Lutheran church will also erect a college.

St. Thomas, Ont.
Tenders addressed to Wilson, Son & Arnold, architects, Chatham, Ont., and Rev. Dr. Grundy, St. Thomas, Ont., will be received until June 21st for all trades in the erection of a concrete, stone and brick church.

Tenders have been received for the alterations to the Registry office. The lowest tenderers were as follows: Mason work, A. E. Ponsford, $3,285; carpenter and iron work, $2,100; plastering, Chas. Lee, $390; painting, Ed. Dallyn, $150; plumbing, E. B. Dixon, $540.60; electric work, Ingram and Davey, $50.50; metal work, Hamilton and Stott, $35; slate roofing, Chas. Riddle, $241. The matter is in abeyance pending the decision of the council in regard to plans.

Victoria, B.C.
Competitive designs for the Y. W. C. A. building are invited from local architects until June 30th. Address A. J. Brace, general secretary.

Watrous, Sask.
Plans for the new $15,000 school are now ready.

Welland, Ont.
$17,000 will be spent on additions to the Fourth Ward and Central public schools.

Winnipeg, Man.
President Meyerfield and Manager Beck, of the Orpheum Theatre Circuit, will shortly be in Winnipeg with plans for a new opera house.

Tenders were recently taken by J. Turner, 1623 Logan avenue, for two storey addition to Brooklands School.

The Christian Scientists will build a church, corner of River avenue and Nassau street.

AWARDED.

Burnside, Man.
The contract for the construction of the new Presbyterian church has been awarded to Bedman & Oburn, of Portage la Prairie, at $2,397.

Cayuga, Ont.
Bennet and Vymburger, Haldimand, secured the contract for the erection of the Haldimand House of Refuge, at $20,768.

Cardston, Alta.
Cahoon Q Newton have been awarded the contract to erect the Taylor Academy. Cost $41,000.

Estevan, Sask.
McKenzie & Prevost, of this place, have been awarded the contract to build the Macomi school house costing $8,800.

Port Arthur, Ont.
A. E. Gerrard was awarded the contract for the new theatre building for $15,000.

Raymond, Alta.
J. C. Cahoon & S. S. Newton secured the contract to build the new $40,000 school

St. John,s, Nfld.
W. A. McKay & Company, of Sydney, N.S., have secured the contract for the electric installation of the new government museum buildings.

Toronto, Ont.
Keith & Fitzsimmons were awarded the contract for the fixtures for the new public bath house at $315. The highest bid was $510.

Vancouver, B.C.
The contract for the main building for the Vancouver Exhibition Association has been awarded to Layfield and Williams.

H. B. Watson has let the contract for brick school house to Baynes & Horrie, contractors; the amount is $40,000.

Contractor R. Forshaw has the contract to build a brick school house for T. Korenaga, 196 Powell street; amount $4,000.

McLean & Fulton have the contract to build assembly hall for A. J. Woodward. It is to be of brick, heated by hot water plant. The architect is J. S. D. Taylor. Amount, $7,500.

Woodstock, N.B.
The contract for building the court house was awarded to R. A. Corbett, St. John, for $21,930, which includes repairs to the record office. The other tenders were: B. F. Smith, East Florenceville, $32,880; Fred. Ryan, Fredericton, $32,625; Smalley & Post, Woodstock, $25,000; John Flood, St. John, $25,000; Jos. McVay & Son, St. Stephen, $23,659; Burley & Ruddick, St. John, $22,765.

Wauchope, Sask.
J. H. Bergstrom secured the contract to erect the new McCauley school.
house.

Winnipeg, Man.
Malcom Bros. have the contract to build the school addition to the Augustine church at a figure of $3,900. J. H. G. Russell, architect.

Architect Teeter has awarded the following contracts for the Fort Rouge Baptist Church: Stone work, Fraser & McDonald; carpentry, J. H. Neil; galvanized iron work, Campbell Heating Company; plumbing and heating, Randall & Bell; electric wiring, Goodyear Electric Company; lathing and plastering, R. J. McDonald; painting and glazing, R. Crawford. The total cost will be $41,750.

Residences

Brandon, Man.
A. H. Bartlett is getting plans from G. L. Steinrich, of Winnipeg, for an apartment building. The proposed building will be of solid brick, 78 x 120 feet, 3 storeys, and full basement. Cost $60,000.

The following will have residences built: Wm. Ferguson, J. S. Maxwell, P. E. Rice and G. Warren.

Elkhorn, Man.
George Harris, contractor, of Virden, Man., will erect a brick Methodist parsonage, 27 x 39 feet, at Elkhorn.

Edmonton, Alta.
R. Vancamp has taken out a permit to build a $3,500 house. E. J. Taylor will build a $5,500 brick residence with a $1,500 stable.

Contractor Grant, of Winnipeg, will shortly begin the erection of an apartment building to cost $150,000.

Foxwarren, Man.
The following will build residences this season: R. Myers, Mrs. John Leckie, O. Burdett and W. Boyd.

Hamilton, Ont.
G. Ritchie will build a $2,500 brick house on Grant avenue.

Kamloops, B.C.
W. Hargraves, jr., and R. H. Corbett will erect residences this season.

Lumsden, Sask.
The following will erect residences here: W. B. Watkins, Ed. Cooney, W. J. McAlmond, Wm. Kinnon, A. G. Hunter, John Horner, Dr. Seins.

Lethbridge, Alta.
Architect J. A. McDonald has plans for a residence for J. N. Ritchie.

North Toronto, Ont.
The Zion Methodist Church, Wychwood, has decided upon the immediate erection of a parsonage on St. Clair avenue.

Ottawa, Ont.
Recent permits for building construction at Ottawa have been issued as follows:—Wolf Shenkman, dwelling, $2,000; William Hunt, dwelling, $3,500; John Black, dwelling, $4,000; A. E. Slemon, dweliing, $4,600; T. J. Somerville, dwelling, $1,600; D. A. Martin, double dwelling, $5,000; J. G. Davidson, dwelling, $3,000; Michael Ouellette, dwelling, $1,800; George Hammond, dwelling, $3,500; J. H. Simpson, addition to dwelling, $2,000; J. More, dwelling, $3,000; Cleophas Perron, double dwelling, $3,000; Thomas Clarey, dwelling, dwelling, $2,000; P. J. Brennan, three dwellings, $4,600.

Port Arthur, Ont.
A solid brick building will be put up for A. E. Guerard. J. E. Cauchon, Jr., architect, has plans.

Saskatoon, Sask.
The following are building: A. Ross, J. Comrie, H. M. Earle, R. H. Timmons, J. W. Petapiece, E. W. McGill, E. McLaughlin, A. McDonald, J. F. Johnson, F. H. Webb.

St. John, N.B.
Tenders addressed to C. J. Desbarats, Acting Deputy Minister of Marine and Fisheries, Ottawa, Ont., will be received until June 30th for the construction of a wooden dwelling and an oil shed at Peck's Point, N.B. Plans and specifications may be seen at the Department at Ottawa, and at the postoffices at Shediac, Sackville, Dorchester and Rockport.

Rocanville, Sask.
Smith & Bruce, arcihtects, Winnipeg, have completed plans for a fine residence for L. Leadbetter, of this town.

Vancouver, B.C.
W. T. Bruin will proceed with the erection of a dwelling. F. L. Johnson has completed arrangements for the erection of a residence. R. B. Impet has let the contract for building a modern house. H. Fogg will proceed at once with the building of a residence.

Wilkie Allen, architect, is having a new residence built for Dr. Buller.

Honeyman & Curtis, architects, have plans for a house for J. A. Ward Bell. It will be built by day labor.

F. Gladwin, contractor, has a permit, $6,000, for two two-storey stone veneered frame houses for W. C. Stearman; hot water heating.

J. A. Jackson has a permit for a $4,000 frame dwelling house, concrete basement, etc.; hot air furnace; electric wiring. Owner, Mr. B. Russell. Architect, C. H. Allan.

Winnipeg, Man.
Chisholm & Son, architects, this city, are preparing plans for a large new residence for Mr. J. T. Gordon. Estimated cost $40,000.

Plans have been prepared to erect an apartment block on Notre Dame, east of Gertie street.

Architect Matthews recently took tenders for erection of apartment block for W. G. Willoughby.

The following will erect dwellings: E. W. Andrews, Grosvenor street, $9,000; J. Isenberg, (six), Salter street, $10,000; J. Isenberg, (ten), Selkirk and Bannerman ovenues, $18,000; G. T. Goodmundson, Victor street, $3,000.

Edward Brown, of Portage la Prairie, will erect a $30,000 residence at Armstrong's Point.

D. Abramovitch, architect, 300 Stella street, wants carpentry tenders for seventeen houses.

Shaw & McNeil, architects, want tenders for several cottages to go up in Fort Rouge.

Tenders for Fisher & McArthur's apartment block were recently taken by John Woodman, architect.

C. J. McMurray will build a $5,500 house on Home street, near Ellice avenue.

R. H. Lear, plumber, will have an apartment block erected corner Langside and Buell. Excavation has been let.

The following have started residences: D. H. Carmichael, Carruthers street, $2,000; A. Scobie, Morley street, $2,000; M. Jordan, Canora street, $5,500; L. Buchanan, Burrows avenue, $3,000; H. C. Moncreith, Ethel avenue, $9,000.

AWARDED.

Edmonton, Alta.
The contract for the large apartment house to be erected in this city by R. Lemarchant at a cost of $140,000 has been awarded to Chas. May. A portion of the building will be completed this year at a cost of about $50,000. A. N. Calderon, architect.

Guelph, Ont.
W. T. Tanner, architect, has awarded the following contracts for residence of Dr. H. C. Skinner: Masonry, Taylor Bros.; carpentry, J. Meagher; lumber, R. Stewart & Company; plastering, J. J. Mahoney; painting, W. B. Smith; tinsmithing, H. Occomore & Company; heating, wiring and plumbing, Stevenson & Malcolm.

Regina, Sask.
Wilton & Wilson have secured the contract to build a residence for J. A. Allan. Cost, $8,000.

Treherne, Man.
George Brock got the contract to build the new Methodist Parsonage.

Vancouver, B.C.
J. J. Miller has let a contract to J. B. Flater, contractor, for erection of a brick veneer dwelling at $10,000.

H. Hudson has the contract for building a residence for T. S. Smith; frame, concrete basement; hot air furnace. Wm. Fred Gardiner, arcihtect. Contract price, $5,000.

Architect C. H. Doverman & Son, architects, have given a contract, $4,000, to W. Leys & Company, to build a frame dwelling for J. R. Read. Hot air furnace, stone basement, etc.

Winnipeg, Man.
Copping Bros. have the contract to build two residences on Greenwood Place, close to Portage avenue, costing $8,500.

W. Luttas has the contract for the construction of a parsonage for St. John's Methodist Church. Cost $4,000.

Yorkton, Sask.
Logan & Black, have been awarded the contract to erect four houses costing over $10,000.

Business Buildings and Industrial Plants

Bala, Ont.
The Windsor summer hotel, owned by Mrs. McDevitt, was wrecked in an explosion last week.

Berlin, Ont.
The buton works of J. Y. Shantz & Son were destroyed by fire last week at an estimated loss of $100,000.

Brandon, Man.
Geo. White & Sons have taken out a permit for the erection of a warehouse. Cost, $3,500.

Wm. Ferguson will have a brick block put up at once. Cost over $10,000. Architect T. Sinclair.

Brantford, Ont.
Morgan Harris will build a handsome residence on Dufferin avenue.

Schultz Bros. Company announce that they will erect a three storey building on Dalhousie street.

The Massey-Harris Company have taken out a building permit for a new warehouse to cost $14,500.

Work has commenced on an addition to the factory of Quality Beds, Limited. Contractors, P. S. Peacock and M. Vanderburg.

Charlottetown, P.E.I.
The Queen's Hotel was damaged by fire recently at a loss of $10,000.

Cranbrook, B.C.
A number of citizens have organized a company for the purpose of manufacturing brick. Machinery has already been installed. V. A. Rolland and N. A. McDonald are interested in the proposition.

Carlyle, Sask.
A farmers' elevator is to be erected here. S. J. Kent is the secretary.

Carnduff, Sask.
Boyle & Crozier, of Brandon, will have a three storey solid brick hotel erected here.

Carstairs, Alta.
The Imperial Elevator Company will put up an elevator here. The Alberta Grain Company will also erect an elevator.

Edmonton, Alta.
Architect J. E. Wize has plans for a three storey brick and concrete store and office block.

Mrs. Mary E. Looby, is to have a two-storey brick office and store block erected at a cost of $16,000.

Fernie, B.C.
A. Ruzzuto has purchased the Imperial hotel business and will erect a handsome hotel on the site of the present building.

Fort Frances, Ont.
There is a possibility of a 1,000-barrell flour mill being erected by a company from Montevideo, Minn.

Galt, Ont.
Geo. Stevens, Sr., will erect a new two-storey brick structure on Ainslie street.

Halifax, N.S.
The Nova Scotia Furnishing Company's building was recently destroyed by fire at a loss of about $8,000.

Hull, Que.
Fire caused $7,000 damage last week in the furniture factory of Isodore Pauin. The building was gutted.

Humboldt, Sask.
Mr. Enge, of the Aberdeen Flour Mills, will erect a mill to cost $25,000.

Kamsack, Sask.
Elevators are to be built at Kamsack and Tessier.

Lumsden, Sask.
H. T. Baker & Company will have a store erected. Plans are now being prepared.

Melville, Sask.
Campbell & Lucas will have a business block erected.

The Saskatchewan Western Company, Limited, will erect an elevator here.

J. N. Pomerlean, of the Richelieu hotel, Edmonton, will build a new hotel in Melville.

Medicine Hat, Alta.
W. T. Williams, architect, has just taken tenders for the new Merchants' Bank building.

Nelson, B.C.
The J. Y. Griffin Company will spend $20,000 in extending and enlarging their premises at Nelson.

North Sydney, N.S.
A project is on foot for the establishment of a large smelting and reduction plant. J. H. Brown, of Montreal, is interested.

Osage, Sask.
An elevator is to be built here this season.

Ottawa, Ont.
The Bank Street Real Estate Syndicate has purchased the property at the northwest corner of Bank and Nepean streets, where they will erect a large store building.

Port Arthur, Ont.
The Canadian Northern will commence a building to go up this summer.

O. H. Waug, Sons & Company, of Buffalo, will erect a factory in this city.

The Bank of Montreal have plans for operations at once on a six-storey hotel to cost $250,000.

The Stanworth-Martin Company are putting in a new stone-working plant and will enlarge their premises.

It is stated that Mr. B. Dawson, of Campbellford, Ont., was in the city last week arranging preliminaries for the location of a large bridge building works.

Prince Albert, Sask.
T. R. Fenton has plans for the new Imperial Bank building.

Quebec, Que.
In a fire which occured last week in the sash and door factory of Gignac & Beland, property to the value of $125,000 was destroyed. The stone and brick building of the Parisian Corset Company and eleven houses were burned down.

Red Deer, Alta.
The Alberta Pacific Company will enlarge their elevator here.

The Canadian Bank of Commerce and Northern Crown Banks are expected to put up blocks this year.

Regina, Sask.
The Dominion Linseel Oil Company have plans ready for a $200,000 linseed oil mill.

Reston, Man.
A new bank building will be put up here. No further details yet to hand.

Rosthern, Sask.
Henschel & Company will erect a brick veneer store building.

Saskatoon, Sask.
Elford & Cornish will erect a business block.

J. G. Nicholson will build an addition, 40 by 60 feet, to his warehouse.

The New Prague Milling Company who are building a flour mill at Moose Jaw, are negotiating for a millsite at Saskatoon.

Stratford, Ont.
The ratepayers will vote on a bylaw to guarantee the bonds of the Stratford Motor & Carriage Company, for $25,000.

St. John, N.B.
The Reformed Baptist Alliance is considering the erection of a new hotel building at Beulah. It is planned to start work this fall on a new building to accommodate 200 persons.

The visit of Sir Robert Perks, Bart., M.P., to this city last week has revived the talk of a dry dock. Sir Robert was interviewed by George Robertson, president of the Imperial Dry Dock Company, and it is said that the project may yet go through. British capitalists are interested.

Sault Ste. Marie, Ont.
The "Soo" lock gates were carried away last week causing considerable damage.

Toronto, Ont.
It is stated that the financial arrangements have been completed for the erection of a 14- storey business block on Yonge street. Further announcements are expected shortly.

Geo. W. Gouinlock, architect, is preparing plans for a fourteen storey office building to be erected on Terauley street, opposite the western entrance to the city hall, by Mr. Geo. H. Gooderham, at a cost of $300,000.

Tenders addressed to Darling & Pearson, architects, 2 Leader Lane, will be received until June 18 for all trades in the erection of a branch bank for the Canadian Bank of Commerce at the corner of Gerrard street and Pape avenue.

Vancouver, B.C.
The Mundy Lumber Company's mill was burned last week at a loss of $200,000.

Victoria, B.C.
Stephen Jones, proprietor of the Dominion hotel, intends to have large additions made.

Plans are being prepared for the construction of a brick building for the Victoria Hardware Company.

(Continued on page 25)

Tenders and For Sale Department

Tenders

will be received by the City of Toronto, Canada up til noon of JUNE 30TH, 1909, for laying between 350,000 and 450,000 duct feet of underground conduit.

For specifications, form of tender, etc., apply Electrical Department, City Hall. 25

Tenders Wanted

Tenders will be received by the undersigned until twelve o'clock noon, SATURDAY, JUNE 26TH, 1909, for the building and erecting of a Public Library in the town of Ingersoll. Plans and specifications may be seen at the office of Nagle & Mills, Ingersoll, Ontario. Bulk and separate tenders will be received. The lowest or any tender not necessarily accepted.

J. L. PATERSON,
Ingersoll, Ontario,
24 Chairman of Committee.

Notice to

Pavement Contractors

The City of Fredericton will receive proposals from Pavement Contractors until the NINETEENTH DAY OF JUNE, A.D. 1909, for the construction of 4,000 square yards of permanent pavement and 700 lineal feet of combined curb and gutter, or more.

Any contractor submitting proposal must attach specification for the construction of the pavement which he proposes and the life guarantee of same.

The City reserves the right to reject any or all tenders, but in the event of their awarding contract, a deposit of 5% of estimated cost will be required.

A. K. GRIMMER,
City Engineer.

Fredericton, N.B., June 7th, 1909. 24

Town of Walkerville

Tenders for

Pavements and Sidewalks

Sealed tenders will be received by registered post, addressed to the undersigned up to noon on MONDAY, THE 28TH DAY OF JUNE, 1909, for the construction of Pavements and Sidewalk on the following streets in the Town of Walkerville:

Concrete pavement and concrete curb on Brant Street, from Victoria Road to Kildare Road.

Concrete pavement and curb on Windemere Road from Assumption Street to Niagara Street.

Concrete pavement and curb on Victoria Road from Wyandotte Street, running 410 feet south of Niagara Street.

A concrete sidewalk on the west side of Victoria Road from Niagara Street south to Huron Street.

Plans and specifications may be seen on application to Mr. Owen McKay, C.E., Walkerville.

Tenders must be accompanied by a marked cheque, made payable to the Town Treasurer, equal to 5 per cent. of the amount thereof.

Should any party whose tender is accepted fail to execute the necessary contract and bond for the due fulfilment of the same, his deposit will be forfeited to the town.

Deposits of unsuccessful tenderers will be returned.

The lowest tender not necessarily accepted.

The names of two responsible persons willing to act as sureties must accompany each tender.

CECIL H. ROBINSON,
Town Clerk,
Walkerville.

Walkerville, Ont., 9th June 1909. 25

TOWN OF CLINTON

Province of Ontario

Water Works

Sealed Tenders will be received by the Town Clerk until 8 p.m., on

TUESDAY, JUNE 29TH, 1909

for the following sections of the proposed Water Works System:

"A"—Labor Pipelaying
"B"—Pump House
"C"—Water Tower
"D"—Cast Iron Pipes
"E"—Hydrants, Valves, etc
"G"—Pumping Machinery
"H"—Producer Gas Plant
"L"—Receiving Basin

Plans and specifications may be seen at the Town Hall, Clinton, or at the office of the Chief Engineer, 103 Bay St., Toronto, on or after June 8th.

D. L. MACPHERSON, Esq ,H. WILTSE, Esq.,
Clerk, Mayor,
Clinton, Ont. Clinton, Ont.

WILLIS CHIPMAN, C.E.,
Chief Engineer,
Toronto, Ont.

Dated May 28th, 1909 24

TOWN OF CHAPLEAU

Province of Ontario

Tenders for Water Works

Sealed Tenders will be received by the Clerk until 8 p.m. on

MONDAY, JULY 5TH, 1909,

for the following sections of the proposed Water Works System:

Contract "A"—Pipelaying
" "B"—Pump House
" "C"-Water Tower
" "D"—Cast Iron Pipes and Specials
" "E"—Hydrants, Valves, etc.
" "G"—Steam Pump
" "H"—Two Boilers

Plans and specifications may be seen at the office of the Clerk, Chapleau, or at the office of the Chief Engineer, Toronto, on and after June 21st.

GEO. B. NICHOLSON, Esq.
Mayor,
Chapleau, Ont.

W. H. FARRELL, Esq.
Town Clerk,
Chapleau, Ont.

WILLIS CHIPMAN, C.E.
Chief Engineer,
103 Bay Street,
Toronto, Ont. 25

Sealed Tenders

will be received by the undersigned or by Wm. Lane, Clerk, County of Huron, Goderich, P.O., Ont., until SATURDAY, THE 19TH DAY OF JUNE, 1909, for the erection of a

Steel Bridge

to be erected over the Bayfield River on the boundary between the townships of Goderich and Stanley.

The bridge is to be one span, 115 feet long, roadway 14 feet, concrete floor, riveted truss. Coopers specifications 1905, Class B.

A good place to erect, 16 feet from floor of bridge to bed of stream. About four miles from Clinton, a station on the G.T.R.

Tenders must be accompanied by strain sheet and marked cheque equal to 10 per cent. of the contract price and payable to the County Treasurer Should any party fail to carry out the contract, the deposit will be forfeited to the county. The deposits of unsuccessful tenderers will be returned.

The lowest or any tender not necessarily accepted.

The bridge is to be finished complete on or before the first day of October, 1909.

D. PATTERSON,
County Commissioner,
Auburn, P.O., Ont.

Dated June 7th, 1909. 24

Wanted

Capitalist Partner to engage in the manufacture of stone, imitation of the best granite. Process secret. Can be sold in any district, much lower than other stone. Apply Box 787 CONTRACT RECORD, Toronto. 27

Tenders

Owen Sound Water Works

Sealed bulk tenders addressed to the "Chairman of Waterworks Committee," will be received up to 6 p.m. of FRIDAY, JUNE 25TH, for any one or all of the following:—

(a) Pipe laying—25 000 ft.
(b) Construction of concrete dam.
(c) Construction of filter beds.
(d) Construction of 5 million gallon concrete reservoir.

A certified bank cheque payable to the Treasurer of the Town of Owen Sound for five per cent. of the contract price to accompany each tender, the same to be forfeited if the successful tenderer declines the contract or fails in the performance thereof. Cheque to be returned in case of non-acceptance.

Plans and specifications can be seen at the office of the Town Engineer.

The lowest or any tender not necessarily accepted.

JOHN McQUAKER,
Chairman, Waterworks Com.

R McDOWALL, C.E.,
Town Engineer.

Owen Sound, Ont.,
June 2, 1909. 24

Sealed Tenders

whole and separate, for substructures and superstructures of the following bridges, endorsed "Tenders for Bridges," addressed to the undersigned, will be received at this Department until noon of THURSDAY, JUNE 24th, 1909:—

Tunnel Bridge over Mississauga River, Township of Wells—Concrete abutments, steel superstructure and gradual approaches.

Dausey Bridge at Blind River—Concrete piers, steel superstructure and filling approaches.

Boston Creek and White River Bridges on Larder Lake Road—Concrete piers, steel superstructure and filling approaches.

Bridge over Madawaska River, Matawatchin Township—Masonry piers and steel superstructure.

Plans and specifications may be seen and forms of tender obtained at this Department, at the offices of W. E. Kerr, Inspector of Colonization Roads, New Liskeard; S. Cole, Inspector of Colonization Roads, Thessalon, and H. N. Moss, Inspector of Colonization Roads, Renfrew.

An accepted bank cheque, payable to the order of the Hon. J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender, and the bona fide signatures and addresses of two sureties, or the name of a Guarantee Company prepared to give a Bond, approved of by this Department, must accompany each tender.

The Department will not be bound to accept the lowest or any tender.

By order,

H. F. McNAUGHTEN,
Secretary of Public Works.

Department of Public Works, Ontario, Toronto,
June 12th, 1909.

Newspapers publishing this advertisement without authority will not be paid for it. 24

Town of North Battleford

Province of Saskatchewan

TENDERS WANTED

Sealed tenders, addressed to the undersigned Secretary-Treasurer, and marked "Tenders," will be received until 8 p.m., on FRIDAY, JULY 2ND, 1909, for

(A) Excavating and pipelaying.
(B) Erection of pump house and power house.
(C) 1. Furnishing and erecting steel stand pipe.
  2. Concrete foundation for stand pipe.
  3. Housing for stand pipe.
(D) Furnishing cast iron water pipes and special castings.
(E) Furnishing fire hydrants, gate valves and valve boxes
(G) Furnishing and erecting pumping machinery.
(H) Furnishing and erecting boilers.
(J) Furnishing and erecting steam engine.
(K) Furnishing and erecting electrical equipment.

Plans and specifications will not be sent out but may be seen at the offices of the Chief Engineer, 103 Bay Street, Toronto; Room 47, Canada Life Building, Winnipeg; or at the office of the Secretary-Treasurer, North Battleford.

The lowest or any tender not necessarily accepted.

J. A. GREGORY, Mayor.
S. COOKSON, Secretary-Treasurer.
WILLIS CHIPMAN, Chief Engineer. 24

Positions Wanted or Vacant

TINSMITH WANTED for Ontario—Good mechanic, all round man; state experience and wages. Box 789 CONTRACT RECORD, Toronto. 24

STATIONARY ENGINEER—Ten years experience, licensed for 1909, wishes position, start immediately, Address Box 790 CONTRACT RECORD, Toronto. 24

WANTED—First year School of Science man seeks position in construction or survey work—competent and willing worker. Have also had experiencc as railroad clerk and timekeeper. Box 751 CONTRACT RECORD, Toronto. 24

WANTED—AT ONCE—FOREMAN FOR GENERAL TINSHOP; must be first class workman on cornice, skylights, mill pipe and heating work; must be quick and sober; none other need write; state age and experience; wages from $5 to $6 per day, eight hours. Box 778, CONTRACT RECORD, Toronto. 24

Miscellaneous

REPRESENTATIVES WANTED—A United States firm manufacturing Steam Rollers, Road Locomotives and Road Making Machinery want Canadian representatives in Toronto, Montreal, Vancouver Winnipeg and other large cities. This is a splendid chance to get hold of a desirable and good-selling line. Box 784 CONTRACT RECORD, Toronto. 27

Business Chance

A United States Firm manufacturing Composition Capitals, Interior Plastic Relief, Composition Ornaments, etc., are open to appoint Canadian agents in Toronto, Montreal and other large cities. A liberal arrangement will be made with a desirable firm. Box 785 CONTRACT RECORD, Toronto. 27

Business Buildings and Industrial Plants

(Continued from page 23)

Wadena, Sask.

Arrangements have been completed for the building of a creamery here.

Wainwright, Alta.

E. D. Simpson, arcihtect, has plans for a new hotel to be erected for Mr. Hussy. Three storeys, brick construction.

Wilkie, Sask.

The Union Bank are getting plans ready for a new bank building here.

Winnipeg, Man.

The Stuart Machinery Company, Limited, will have a large new warehouse erected. W. A. McLeod, manager, is getting plans.

The H. W. Johns-Manville Company, of Milwaukee and New York, will open a branch in Winnipeg, and probably erect a factory.

The Gas Traction Company, Limited, will erect a plant to manufacture gasoline engines in Elmwood. Cost $75,000. O'Grady & Anderson are the promoters.

Darling & Pearson, are preparing plans for a Canadian Bank of Commerce branch building to go up in Fort Rouge. The Main street offices will be enlarged next year.

The Knechtel Furniture Company, of Hanover, Ont., are excavating for a $25,000 warehouse on the corner of Henry avenue and Lulu street. G. G. Teeter, architect.

Architect Atchison has plans nearly completed for a brick office building on Portage avenue, 40 by 100 feet, with terra cotta front. Cost $50,000. Work will be begun at once.

J. H. Sutherland, J. R. Sutherland and John S. Blanchard have formed the United Glass Manufacturing Company, Limited, and will erect a big glass factory and warehouse adjoining the G. T. P. shops.

Woodstock, N.B.

Dickinson's tanery was destroyed by fire last week at a loss of $50,000.

Yorkton, Sask.

A company is being formed to build a warehouse. W. D. Dunlop and F. Pawlett are interested.

AWARDED.

Brandon, Man.

Chas. Hall has the contract for a new brick block on Ninth street for C. S. Unicume. Estimated cost, $12,000.

Brantford, Ont.

The contract for the new Sanderson-Harold refrigerator and screen door factory at Paris, has been awarded to J. D. Tindale, Ingersoll, and the work of construction will commence immediately. The cost of the new building is estimated at $30,000. The plans call for a two storey building, 300 x 62, with an engine room 40 x 60 feet, of brick and mill construction.

Calgary, Alta.

Geo. H. Archibald & Company, Winnipeg, have the contract to erect a six-storey reinforced concrete building for W. R. Hull, to be called the Grain Exchange Building.

Corinne, Sask.

O. K. Wilson secured the contract to build a 30,000-bushel elevator here.

Prince Albert, Sask.

The contract for the erection of a 5-new Company's new building has been awarded to Wortley, Ittner & Spore. Total estimated cost, $40,000.

Regina, Sask.

Smith Bros. & Wilson have got the contract to erect a business building for E. C. Corbeau.

Storey & Van Egmond, architects, have awarded contracts to W. M. Lambert, for Geo. Peacock's residence, and warehouse for Peart Bros. Hardware Company to McGregor and Black.

Saskatoon, Sask.

Sam Brown, of Winnipeg, has been awarded the contract for the Saskatoon branch of the Bank of Montreal.

Welland, Ont.

The contract for the additions to the plant of the Frost Wire Fence Company has been awarded to Geo. E. Mills. Plans prepared by W. A. Edwards, architect.

West Toronto, Ont.

The contract for the new machine shops for the C. P. R. has been awarded to Bishop and Buchanan, of Peterborough, Ont.

Winnipeg, Man.

The contract for the eretcion of a 5-storey business block for Fisher & McArthur has been awarded to McQuarrie & McLeod at a figure in the neighborhood of $130,000. Plans prepared by Architect Woodman.

The Manitoba Bridge & Iron Works, Limited, of this city, have secured the contracts for the structural steel and iron required in the following named buildings, during the past three weeks: Winnipeg Apartment block for Cross & Counsell; store building for C. Metcalfe; twenty station buildings for the National Transcontinental Railway; Power street mission; residence for G. W. Allen; warehouse for A. R. Williams Machinery Company; extension to Farmers' Advocate building; apartment block for F. H. Scholey; Fork river bridge; new building, St. Joseph's Orphanage. Saskatoon—New station for the Canadian Northern Railway; 100 feet steel stack for city of Saskatoon; Bank of Montreal new building; new building for Dr. Mackay. Calgary—Samis block; Shaw & Cooper block (Nanton). Edmonton—New convent building. Moose Jaw—Y. M. C. A. new building; new fire hall; new block for J. A. Grayson; new Robinson block. Prince Albert—New building for the Agnew Bros. Hardware Company. Medecine Hat.—New high school building. Orders have also been secured for the complete power transmission installations for 22 grain elevators and a large order of mining equipment including cars, rails, etc. This progressive company is making extensive additions to its plant and it is expected that the volume of business will be very largely increased before the end of the season.

Power Plants, Electricity and Telephones

Berlin, Ont.

A by-law to provide $19,000 for double track work on the street railway will be voted on by the ratepayers on June 28th.

Bridgewater, N.S.

Plans are being considered by the Canadian Mines Company for the construction of a hydro-electric power plant to supply electricity to operate the mines and to supply the city of Bridgewater with electricity for lamps and motors. The company also proposes to furnish the surrounding territory with electrical service.

Edmonton, Alta.

A French syndicate, represented here by Short, Cross & Biggar, attorneys, has applied to the city council for franchises for the construction of radial railway lines from this city with a total mileage of 160. The franchises will, in all probability, be granted, the Council being strongly in favor of the proposition.

The Provincial Government has entered into an agreement with the Automatic Telephone Company, of Chicago, Ill., to install automatic telephone systems in East Calgary and Lethbridge. It is understood that similar equipment will be placed in other cities in the province during the summer.

Hamilton, Ont.
The ratepayers of this city recently carried a by-law authorizing the council to make a contract with the Ontario Hydro-Electric Commission. The proposed agreement between the city and the Cataract Power Company was defeated.

Montreal, Que.
We are advised that the Montreal Engineering Company are at present in the market for four hydro-electric units with an aggregate capacity of 50,000 h.p., for the Western Canada Power Company, Limited. It is probable that two units will be installed immediately.

Contracts have been placed by the trustees of the McGill University for the installation of a power plant for the university, at an approximate cost of $150,000. Prof. R. J. Durley, of McGill University, will have charge of construction of the plant.

Niagara Falls, Ont.
The Niagara Power Company have authorized the issue of bonds to provide twenty-five million dollars. Several millions of this will be spent in extensions to the Canadian plants.

Victoria, B.C.
Owing to the delay of the City Council in acting on the recent proposition by the British Columbia Electric Railway Company, the plans for the development of water power on Jordan river have been held up. The company is willing to continue to take power from Coldstream if the city buys out the Esquimault Company's works. It is endeavoring to secure the endorsement of the Board of Trade in connection with its proposed plans.

Winnipeg, Man.
Tenders on the hydraulic machinery required in the Winnipeg power development scheme will be called on the 2nd of August and on the electrical equipment on the 16th of August. Distribution of plans and specifications will be made from the office of Smith, Kerry & Chace, Winnipeg.

Winnipeg, Man.
The initial installation at the Thirty Foot Falls generating station of the Winnipeg power development scheme will consist of five direct connected 3,000 K.V.A. 60 cycle, 3 phase, generating units and two banks of transformers, each consisting of three single phase transformers of 3,000 K.V.A. capacity. All electrical control and other auxiliaries, excepting turbine governors will be tendered. The contractors at the site of the works have made good progress, have large plant installed, have unwatered the power house site, and will shortly begin placing concrete in the dams, and walls of plant. The execution of the transmission line contract is well underway and shipments of towers and cable, as also insulators, will begin during June, July and August, respectively.

Miscellaneous

Halifax, N.S.
Tenders for debentures amounting to $120,400, issued for the extension of waterworks, sewers, etc., will be received until July 6th by W. L. Brown, city treasurer.

Keewatin, Ont.
Tenders will be received by W. J. Craig, town clerk, until June 30th for the purchase of $8,000 five per cent. 20-year public school debentures.

Owen Sound, Ont.
Tenders for debentures — waterworks $125,000 and electric light $30,000—will be received until June 18th by John Legate, chairman, finance committee.

Montreal, Que.
Hon. F. L. Haszard, Premier of Prince Edward Island, states that a survey will be made this summer with a view to the construction of a tunnel under Northumberland Straits to connect the island with the mainland.

Ottawa, Ont.
The Marine Department announces that a 35-foot channel between Quebec and Montreal is to be undertaken as soon as the 30-foot channel is completed. Several big dredges are to be built for the purpose at Sorel.

Prince Albert, Sask.
The ratepayers have sanctioned the following by-laws: $40,000 for sewers and waterworks extensions; $13,000 for sidewalks and street grading; $10,000 for the completion of the arc street light system; $10,000 to purchase road making machinery for the macadam pavements.

Rosthern, Sask.
The ratepayers will vote June 29th on a by-law to raise $6,000 for the purchase of a fire protection system.

Sydney, N.S.
Tenders addressed to J. J. Curry, city clerk, will be received until June 30th for the whole or part issue of $153,000 four and one-half per cent. 30-year debentures of this city.

Toronto, Ont.
Recent building permits include: G. B. Smith, five attached two storey roughcast dwellings, corner Delaware and Shanley, $7,500; Love Bros., Limited, two pairs semi-detached brick dwellings, Gerrard street east, $7,500; D. H. Griffin, pair semi-detached two storey brick dwelling, Emerson avenue, $4,000; Cayea & Lavai, two storey and attic brick dwelling, corner College and Spadina, $3,000; Wm. Maher, two storey and attic brick dwelling, Keele street, $4,000; Mrs. Gallagher, two storey and attic brick dwelling, Warren road, $9,000; Willmott & Alpaugh, pair semi-detached two storey and attic brick dwellings, College street, $5,000; A. A. Kennedy, three attached two storey brick dwellings, Wickson avenue, $6,000; J. O'Leary, three attached two storey brick dwellings, St. Clarens, $6,000; B. Fraser, pair semi-detached two and a half storey brick stores and dwellings, corner Bain and Pape, $4,000; G. E. Sprague, two storey and attic brick dwelling, McKenzie avenue, $4,500; W. C. Charters, two and a half storey brick dwelling. Kingston road, $5,000; H. F. Sanders, two storey brick dwelling, Christie street, $3,000; J. W. Butchart, two pairs semi-detached two storey brick dwellings, Marguerettta street, $8,000; J. Birrell, two storey and attic brick dwelling, Indian road, $4,000; N. B. Grandin, two storey and attic brick dwelling, Galley avenue, $3,000; J. A. Goddard, pair semi-detached and one detached two storey brick dwellings, Lansdowne avenue, $6,000; A. E. Fisher, two pairs semi-detached two and a half storey brick dwellings, Galely avenue, $10,000; Antonio de Zorz Company, one pair semi-detached two storey brick dwellings, Shaw street, $5,000; Jas. Delworth, pair semi-detached two storey brick dwellings, Follis avenue, $4,500; G. L. Thompson, six attached two storey brick stores and dwellings, corner Woodlawn avenue and Yonge street, $18,000; J. W. Devitt, pair semi-detached two storey and attic brick dwellings, London road, $4,000; B. H. Fraser, pair semi-detached, two storey brick dwellings, Bain avenue, $4,000; B. H. Fraser, pair semi-detached two storey rough cast dwellings, Bain avenue, $3,900; B. H. Fraser, 4 pairs Bain avenue, $3,900. B. H. Fraser, four pairs semi-detached two storey roughcast dwellings, Bain, $8,800; W. R. Frankish, one storey brick dwelling, Binscarth road, $3,000; Mrs. J. Donovan, two storey and attic brick dwelling, Binscarth and Edgar, $6,700; M. J. Morris, four attached two storey brick stores and dwellings, Dundas street, $15,000; J. W. Walker, pair semi-detached two storey and attic brick dwellings, Palmerston Boulevarde, $8,500; W. & J. A. Moss, two storey and attic brick dwelling, Lynwood avenue, $6,000; Schultz & Garrett, three attached three storey brick stores and dwellings, corner Bloor street and Palmerston avenue, $18,000; F. J Cummings, two detached two and a half storey brick dwellings, Howard Park avenue, $7,000; J. E. Kerr, two detached two and a half storey brick dwellings, Beatrice street, $3,800; M. Yetman, pair semi-detached two storey brick dwellings, Shanley street, $4,000; Wilkins & Company, four pairs semi-detached two storey brick dwellings, Davenport road, $20,000; Elmer Duff, two and a half storey brick dwelling, Roncesvalles avenue, $3,500; Dr. Cavell, two storey and attic brick dwelling, corner Roncesvalles and West Marion, $4,000; W. M. Rankin, four attached two storey brick stores and dwellings, College street, $12,000; Mitchell & Bennet, pair semi-detached two storey and attic brick dwellings, Gladstone avenue, $6,000; L. C. Sheppard, two and a half storey brick dwelling, Ontario street, $3,000; E. Davies, two and a half storey, brick dwelling, Binscarth road, $10,000; Bert. W. Woon, two and a half storey brick dwelling, Glendale, $3,000; Mrs. A. M. Piper, two storey brick dwelling, Avondale avenue, $5,500; A. McGill, two detached two storey and attic brick dwellings, Keele street, $7,200; Willmott & Apaugh, two and a half storey brick dwelling, Deer Park avenue, $5,300; J. F. Hartz Company, alterations to store, Yonge street, $4,000; E. Taynon, three attached two storey roughcast dwellings, Withrow avenue, $4,000; George Yeo, two detached two and a half storey brick dwellings, Givens street, $7,000; G. A. Powell, two storey and attic brick dwelling, Warren, $8,500; John Bemrose, two storey and attic brick dwelling, Keele, $3,000; Armac Press, two storey brick printing office, Agnes street, $8,000; D. & M. J. Madden, pair semi-detached two and a half storey brick dwellings, Wilson, $6,000; F. J. Cumming, two storey brick dwelling, Pearson, $3,500; G. L. Sutherland, pair of semi-detached two storey brick dwellings, Sunnyside, $4,000; Morris Reid, two pair semi-detached two storey and attic brick dwellings, Marmaduke street, $10,000.

Victoria, B.C.
Tenders addressed to W. W. Northcott, purchasing agent, will be received until June 21st for a steam fire engine of 700 imperial gallons per minute capacity.

Whitby, Ont.
Tenders addressed to Joseph White, town clerk, will be received until June 19th for $16,000 five per cent. 30-year debentures, issued for waterworks and electric light extensions.

Winnipeg, Man.
Tenders addressed to B. H. Smith, secretary-treasurer, public school board, will be received until July 2nd for the purchase of $200,000 4 per cent. 35-year bonds of the school district of Winnipeg.

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Slack Methods of Tendering

Attention was called a short time ago to the growing demand for a more extended time limit on contracts. A brief analysis of the question was made, the resultant evils were discussed and the conclusion was reached that what was desired could be accomplished easily and amicably. Nobody has come forward to confute these arguments, yet it is contended that the matter can be treated from another standpoint, and while it is not necessary to withdraw one word in connection with the former claim, it is interesting to consider the other, so that contractors may either take a little advice in season or "pat themselves on the back," according to the dictates of conscience.

It is said to be more than a common experience of those having plans in charge for contractors to figure, that the inquiries for the plans are exceedingly infrequent until within perhaps a week or less of the time for opening bids. Plans will lay on file for a fortnight before anyone calls for them, if they are placed three weeks ahead of the time for bids, with hardly a call for them. Even the early calls are too often but desultory inspections with the intention of making a real inspection for a figure later on. Then when the plans are in constant demand, with several after them at once, all concerned are compelled to rush their work through with the chance of skipping some of the details in so doing.

This is just an outline of the charges that are laid against the contracting fraternity. Many, in fact the big majority, in the business will be able to refute these charges successfully—and it is only logical that this is so, for it is surely to a man's advantage to form an early acquaintance with all the details connected with a job upon which he means to tender—but, after all, it would not be a very far call to some who, to say the least, are occasionally guilty of procrastination in this direction. It should always be borne in mind that tardiness on the part of the contractor fosters slackness in other quarters and introduces elements which must inevitably result in general dissatisfaction.

The Desirability for More General Co-operation

So much has been said about the relations of those connected with the building industry that many are inclined to relegate the matter "to the shelf" with the settled conviction that what it is desired to bring about can only be accomplished by a process of evolution. To the more progressive ones in the business, however, the subject should appeal far more forcibly. Builders and architects, in particular, should strive continuously, to get at a better understanding. Too often the architect places himself upon a plane considerably higher than that of his contractor, and yet how sudden and complete, occasionally, the tumble, when a timely suggestion of the contractor, accepted in the right spirit, might have saved much discomfort.

No one appreciates the real ability of the architect more than the contractor, whose work brings him into close touch with many, and a good word in the architect's favor from the honest contractor is at all times invaluable. Along the same line comes the treatment of the material man, or manufacturer of the specialty. In many cases he finds the architect not only too busy then to see him, but with no time ahead for an interview. Not until they see their more progressive confrère profiting by what new information he thus gained do many architects know of the new. And so it comes that the specialty man looks up the owner direct, who becomes interested, enthusiastic, and asks his architect to specify it. Of course, the material man is blamed for interfering, for seeing the owner, but what is expected of him—to rest and wait until he is afforded the time to show the merits of his products?

These are considerations which the progressive architect and contractor must always appreciate if they are to get into the front rank and remain there. We are living in a progressive age and in a progressive country, where every man engaged in the building and every other industry is entitled to a fair show. Architects, builders and material men, are all, in their own way, indispensible, and it is only by earnest individual effort along such lines as those indicated that harmonious relations can be established and maintained.

Do not fail to give advice to your customers or prospective customers when they are in trouble. It pays to spend a little to oblige people.

Leading Canadian Contractors

Chas. W. Dill, who will Construct the Filtration Plant for Toronto

The award of the contracts for Toronto's filtration plant has thrown into the limelight Mr. Chas. W. Dill, of Toronto, who was the successful tenderer for the general construction at upwards of half a million dollars. This work has attracted much attention in contracting circles throughout the country, and the following sketch of Mr. Dill's career will doubtless be of interest to many of our readers.

Chas. W. Dill, Engineer Contractor, Toronto.

Chas. W. Dill was born at Bracebridge, Ont., on Aug. 27, 1870, and is a son of Mr. J. W. Dill, ex-M.P.P. for Muskoka. He matriculated in 1888 from the Barrie Collegiate Institute, with first-class honors in mathematics, and three years later graduated from the School of Practical Science as Second Prizeman. From 1891 to 1893 he was associated with Mr. Willis Chipman, C. E., on waterworks and sewerage at Brockville, Brantford and Toronto Junction. During the three years following he was employed as resident engineer in charge of the Delaware avenue street improvement work and was in private practice at Tonawanda, N.Y.

His next connection was an interesting one, for from 1896 to 1899 he was associated with R. S. Buck, C.E., of New York, in the design and construction of the steel arch bridges at Niagara Falls and in superintending the erection of the Upper Steel Arch Bridge. The scene of Mr. Dill's labors was then transferred to Nelson, B.C., where for two years he remained as assistant city engineer, engaged principally upon waterworks, sewers and street improvement work.

In 1901 Mr. Dill returned east and for more than three years acted as assistant to the City Engineer of Toronto, having charge of the roadway department From 1904 to 1907 he was manager of the Constructing & Paving Company, Toronto, in which position he gained a deeper insight into general contracting work. His association with this concern seems to have somewhat diverted the channel of his ideas, for from this time on he has combined successfully the contracting business with his engineering practice. In the spring of 1907, Mr. Dill became associated with Mr. W. B. Russell, C.E., under the firm name of Chas. W. Dill & Company, civil engineers and contractors. A year later he associated himself with the York Construction Company for carrying out the contract of constructing a section of the Trent Valley canal. The latest development, which took place only a few weks ago, was the formation of the partnership of Dill, Russell & Chambers, which was effected with a view to securing the contract for the Toronto filtration plant.

Mr. Dill's latest "coup," or rather enterprise, has placed him in the foremost ranks of Canadian contractors, to the eminent satisfaction of a wide circle of friends, whose best wish is that this contract may prove a satisfactory one to all concerned.

Personal Mention

Mr. T. Aird Murray, C.E., 612 Continental Life Building, Toronto, has been appointed consulting engineer for sewage and water supply for the Province of Saskatchewan. This appointment will not interfere with his work in Toronto, as he will keep up his present office. The new appointment will involve periodical visits to Saskatchewan and the work will be purely of a consulting nature.

Mr. W. A. Campbell, Deputy Minister of Public Works in Ontario, and Mr. A. Broder, M.P. for Dundas, will attend the Good Roads Convention to be held in Seattle this month. They will prepare a detailed report upon their return

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The Canadian production of structural materials and clay products in 1908 was as follows:

	Quantity.	Value.
Cement, natural rock ....bbls.	1,044	$ 815
Cement, Portland ....bbls.	2,665,289	3,709,063
Flagstones ....No.	4,000	3,600
Sand and gravel (exports) tons	298,954	161,387
Sewer pipe		514,042
Clay products, stone, lime, etc., estimated		8,500,000
Total		$12,888,907

Competition for Moderate Cost House

There are just two more weeks left for the preparation or completion of plans intended for the "Contract Record's" competition for architectural students. Those who have not yet entered are advised to "get busy" at once. There is still plenty of time. Some of the greatest architectural conceptions have been outlined in less than two weeks. Full particulars were published in the "Contract Record" of June 9th.

Encouraging Building Reports from Various Points

A Good Year for Contractors, Architects and Engineers—Records Exceeded in Many Places

Exceedingly cheerful reports come from all parts of Canada regarding the pronounced activity in the building trades. From all directions come the statement that operations greatly overshadow those of last year, indeed this general resumption of activity is one of the most noteworthy evidences of business recovery which has shown during the past few months.—Bradstreet's.

Optimistic Building Reports from the Western Metropolis

Winnipeg, June 12.—A big building season is in view for Winnipeg this summer. Architects are as confident as they are busy, and nearly all of them hint that they will have some interesting building announcements to make in the near future. It is a characteristic trait with architects of all cities to keep mum about their work in hand until such time as they deem it expedient. This is probably due to the natural reticence of building promoters, who are not generally desirous of letting the other fellow get an inkling of their plans.

But the numerous nods and winks that were passed around this week, combined with the satisfied smile that literally beams upon the faces of the architects, are sufficient to show that they are busy rushing through plans for some tall buildings.

A number of teams recently gathered at the corner of Hargrave and Cumberland streets and excavation work was commenced on what will be Winnipeg's first flatiron building. The structure will be five storeys in height and will be laid out in apartments. The contractors are McQuarrie & McLeod. They are bonded to complete the building by December 1st. Architect John Woodman prepared the plans.

Discussing the outlook, Architect Woodman stated that a sudden prosperous wave seemed to have hit the city. He believed the chief cause was the good outlook for the crops and the consequent jubilation that this created. "Good crop prospects always loosen the money market," he commented.

Another architect who is being kept busy is Frank R. Evans, who observed that "the numerous big buildings that will go up in Winnipeg this summer would not be built if they were not required." He added that conditions were much improved and the outlook was exceedingly bright.

Architect William Fingland also paid his tribute to the general return of prosperity, and when asked if the situation had improved, replied, "Decidedly so!" The emphasis he placed on the first word left no doubt regarding his firm belief that a remarkably good season is in view.

Architects Smith & Bruce, after referring to numerous small buildings on hand as well as much big prospective work, stated: "It was probably the sudden warm weather after the prolonged cold spell that induced a revival of confidence. It seemed to be the general impression that everything would be delayed, but now that the crops are just as far ahead as they ever were at this time of the year, the public are making up for lost time."

Building Situation at Vancouver

The building activity in Vancouver is beating all records easily, and the building trades unions are taking advantage of the conditions to attempt to force the card system upon the contractors. This system was abandoned two years ago after a bitter industrial fight, and the contractors are determined that they will not again be handicapped by this unfair condition. The Employers' Association and the Builders' Exchange are inviting open shop men from eastern Canada to go west and fill the breach. The alien labor law bars employers from openly engaging men across the border, but workmen over there are aware of the fact, and are drifting into Canada to take the place of strikers. The plumbers, electricians, plasterers and lathers, as well as stone masons, are concerned. The result of the present fight is to turn all the electrical shops into non-union concerns. The plumbers are all running open shops. The plasterers and stone masons who work on granite have very strong unions, and these are the only workmen whom it is found difficult to replace.

Fort William Building Returns

Building permits issued at Fort William, Ont., since the first of the year total nearly $2,000,000.

The permits issued in Victoria, B.C., during May amounted to $188,620, establishing a new record for the month. During the first five months of the year permits have been issued to the amount of $699,080, as compared with $446,760 for the corresponding period of 1908.

According to a recent report from Ottawa, Ont., there is a stiffening tendency in prices of materials there and the labor market is not quite so easy. Generally speaking, prices are getting back to the level, and as the season advances it is expected that building operations will gradually become more expensive. Then the price of labor is somewhat higher than earlier in the spring. The regular laborers with pick and shovel in house construction are getting $1.75 and $1.80 for a nine-hour day on the smaller jobs, and the prices of the trades are rather stiffer. The advance of the carters' prices, if they go into effect, will make a very great difference. It is estimated that it will make $100 difference in the price of houses costing about $5,000.

The unemployed brickmakers of Toronto welcome the news that there will soon be an abundance of brick. Conditions in this connection seem to be hopeful, and another favorable circumstance is, that, under ordinary favorable conditions, building operations this year will run on well into the winter.

A novel plan of introducing a product is being employed by McCormack & Carroll, of Toronto. In their advertisement they offer samples of Lignine Carving to architects, with the privilege of returning the same within ninety days. The advantages of having samples of the actual product while designing will be readily recognized, and the success of the plan seems assured.

Window Frame Construction

Practical Directions for Frames which Keep Out Rain and Snow while Open

How to make a window frame for the attic or a single sash frame for any place, that will admit of hanging so that the sash can be opened and at the same time keep out the snow and rain in stormy weather, is a problem that has caused the carpenter more or less study for years. There is probably no better way to accomplish the work than the arrangement shown in fig. 1.

The sill is made with a lip and then rabbeted as shown at A. The sash is also rabbeted to fit the sill. The sill is plowed at B; and the stool rabbeted to fit into the sill. This allows the sash to be hung at the top; and when closed over the rabbeted sill with the lip, it prevents rain and snow from beating in under the sash. If the sash is tightly closed it is just about storm-proof—so nearly so that not enough of rain or snow will get through to do any damage.

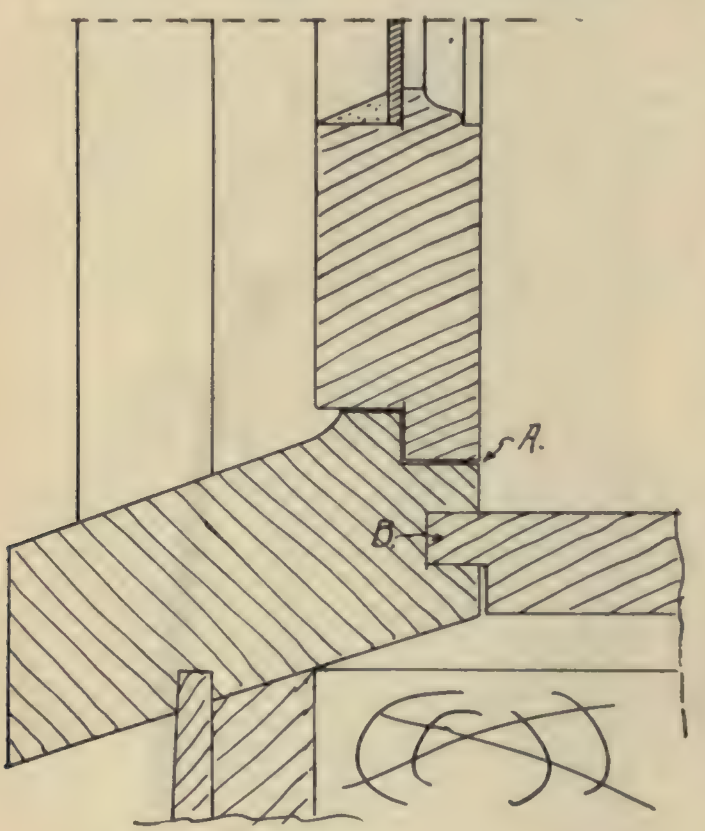

Fig. 1.

With the ordinary window sill it is impossible to hang a single sash either at the top or on the side on account of the bevel on the sill; and then the stool is in the way. Experience generally shows that almost any attempt to hang a single sash in the frame such as ordinarily made results in a very unsatisfactory job. If the window happens to be in some place much exposed, it will be found to be a great annoyance on account of leaks.

A frame constructed with the sill and sash rabbeted as shown in the sketch is as near storm-proof as it is possible to get and have the sash hung so it can be opened readily.

Another point in the construction of windows is in bay windows of the octagon pattern. Many bay windows are made so that the casings join in the angle. When casings join in this manner it is necessary to know just how to set the studding and just the exact width of outside casing necessary to use to make room for the weights, and have it finish up right on the inside.

Referring to fig. 2, it will be seen that it requires an outside casing at least 7 inches wide to get the frame in; and then the studding must be set directly in the centre of the angle. Wherever the frames join, as in this case, it is best to set a 2 by 4 stud in the angle as shown. It prevents the frames from drawing apart in the mitre. The sketch shows that 7 inches is the least width of casing that will do; and this would leave the inside casing to finish up only about 3½ inches in width. The outside casings should be 8 inches wide, then the inside casing would finish up about 4½ inches, which is a better width to make the finish.

It is much better to leave a space of six to eight inches or more between the windows when this can be done, and put on siding with mitered corners. It makes a nicer looking job and is easier to finish on the inside when each frame is independent of the other. Care should be taken in setting frames for a bay window to get them evenly divided and all set to the same height exactly, so that in spacing up the siding there will be no difficulty in coming out right.

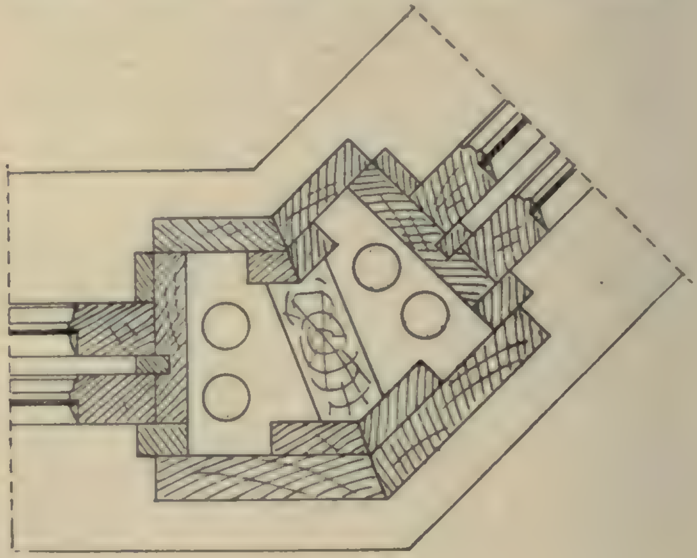

Fig 2.

While we are on the subject of window frames it will undoubtedly be of some interest to know about what the cost of the average window is, put in the house all complete—sash, glass, frame, casings, weights and trim. We will take a frame 24 by 30, which is the average size:

The frame will cost	$2.25
The sash; glazed, double strength	2.40
Inside casings, stops, etc., yellow pine	.75
Sash weights, cord and hardware	.80
Carpenter labor and setting frame and finishing	1.60
Total	$7.80

Thus we find that the average window figured all complete in a house is close to $8, and this figure is none too high. Windows with larger glass would cost proportionately more.

The building permits for May in Vancouver totalled $470,140. The total amount for May last year was $430,925. This makes the fourth month in the year in which the amount of the permits exceeded the corresponding month of the preceding year.

LEGAL DEPARTMENT

Information for this Department is requested from Architects, Engineers, Contractors and Builders. Send in the particulars of recent cases in which you were interested, giving the main facts tersely.

Payment for Decorative Work.—The Divisional Court recently gave judgment dismissing the appeal of H. K. Woodruff, of St. Catharines, from the award of Chancellor Boyd in the case of the Thornton-Smith Company against the appellants. Plaintiffs were engaged to decorate a home for defendant, but they were not allowed to complete owing to a difference with the architect. They sued for $2,364.55 for work done and were awarded $2,100 at the trial. Mr. Justice Britton, in his written judgment, attributed the trouble to the domination exercised over the architect by Mrs. Woodruff, who claimed to be dissatisfied with the work. The result was that the architect took the work away from plaintiffs without giving any reasons or allowing them any opportunity to set right what may have been unsatisfactory. Under the circumstances the court held plaintiffs to be entitled to quantum meruit, as awarded by the Chancellor.

Attachment of Debt.—Before Mr. Justice Mathers in the Manitoba Court, action was brought against the corporation of Rosser to obtain money due for work done under contract. There was an interpleader application on the part of the defendants. The contractor, C. S. DeGroat, had not paid his workmen, and this action was brought by one, Bryson, for wages due to himself and several other workmen who had assigned their claims to him. $865.58 was due DeGroat, and against this were wages claims to the amount of $462, garnishing order of $928.52, and other claims totalling $171.57. The court held that the wage claims should be paid in priority to all others. The garnishing creditors and other order-holders were entitled to be paid in the order in which notice of their claims was given to the defendants. The plaintiffs were awarded costs against the defendants, who, however, were allowed to recover the said costs against garnishing and assignment creditors, who had appeared and contested plaintiffs' rights to the moneys in question, in proportion to their several claims.

Conviction for Failure to Obtain Permit for Alterations Quashed.—In the County Court of Vancouver, Loo Gee Wing recently appealed from a conviction made in the police court of carrying out alterations to his building without first obtaining a permit from the building inspector. The by-law under which proceedings were taken enacts in part as follows:—

"1. The building inspector shall be the inspector of buildings whose duty it shall be to see that the provisions of this by-law are carried out.

"2. The erection or alteration of any building or any part of any building . . must not be commenced in the city of Vancouver until a permit for such erection or alteration shall first be obtained from the building inspector by the owner or his agent, and no such owner or agent shall proceed with the erection or alteration of any building or part of any building . . until such permit has been obtained.

"3. The application for such permit shall be in writing, on a blank form to be obtained at the office of the building inspector . . and shall give clearly and fully the information asked for and required by the by-law . . which information is to be verified by the statutory declaration of the applicant when required by the building inspector . . ."

It was contended for the appellant that no power was vested in the council to pass a by-law requiring a permit for the alteration of a building. The most important feature in the case was that the court could find no provision of the Act incorporating the city whereby the council had power to pass such a by-law. It was established that the council had the right to appoint a building inspector and also the right by by-law to regulate the erection of buildings, specify the kinds of materials to be used in certain areas, etc., and to compel the owner to submit plans prior to the construction of any building or alterations to any building, but if the building or alterations conformed in every way with the requirements of the by-law the owner had a legal right to proceed with its erection and could not be held up until he obtained a permit. The by-law was ultra vires to the extent that it enacted that before the erection or alteration of a building be commenced, a permit must be obtained from the building inspector, and a conviction for not obtaining such permit could not be sustained. No costs were awarded to the appellant in this case, as the court was satisfied that the alterations had been made to facilitate gambling. The conviction was accordingly quashed without costs to either party.

Mr. M. A. Pigott, of Messrs. Pigott & Company, states that the report which recently appeared relating to the action brought by his company against the C.P.R. for $523,574.75 contained an inaccuracy which he desires to have corrected. The report was to the effect that the railway company in its defence stated "that the contending parties held a conference at which both agreed upon a settlement, but that Pigott & Company broke off the negotiations." Mr. Pigott's version of the matter is as follows: "We were negotiating, and adjourned to give them a chance to look over some of our papers, and we met in their office to resume by appointment. Instead of resuming negotiations they presented a final estimate to us which some one prepared and which they said was a final estimate signed by Mr. Peterson, the company's engineer, providing for about $100,000 of a balance which we could get if we took it in full of all claims, and abandoned all other claims and conditions against them. We expressed our surprise that upon coming to negotiate we should be met with a so-called final estimate instead of resuming the negotiations as it was agreed we should do."

Importance of Keeping Tin Roofs Well Painted

Property owners should be made to realize the importance of keeping tin roofs well painted at all times. When roofs, gutters, eaves, troughs and such equipment are to be painted the services of an expert workman are also required to make needed repairs before the painting is done. Work of this character properly falls to the expert roofer, and is not within the province of the all-around mechanic. But if such a mechanic is allowed to attend to the painting, he should at least be furnished with roofing paint of the best quality. Some of the paints used on such work instead of proving a protective from the elements, as they should be, act as an agent of destruction to the best sheet metal made. Good paint and good workmanship should go hand in hand, especially where tin roofs are to be painted.

CANADIAN PLUMBER
HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Soil, Waste and Vent Construction

By WILLIAM HEY *

The accompanying drawings, with explanations, are my ideas of Soil, Waste and Vent Construction.

Soil and Vent Pipes.—As a rule, tenants are not particular as to how roughly they use plumbing fixtures or what they throw into them.

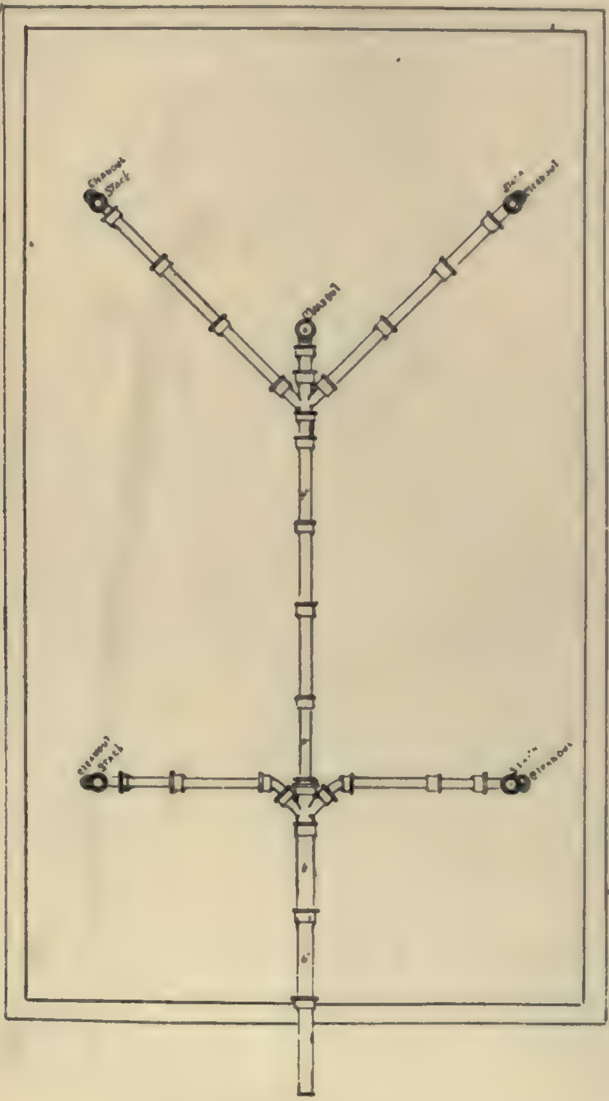

Fig. 1.

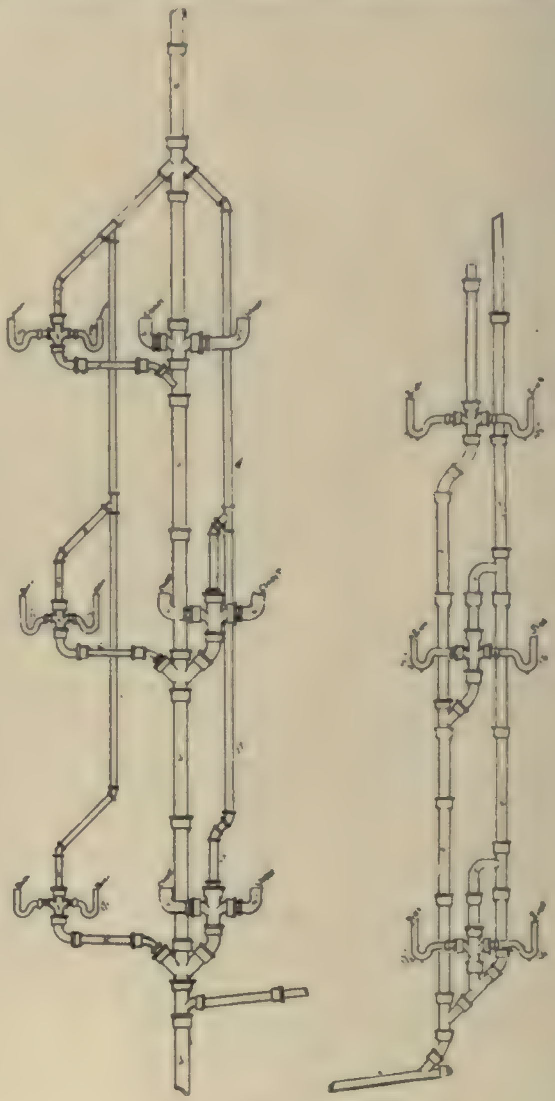

Fig. 2.

Several points are to be considered in installing soil, drain and vent pipes.

First.—Proper size. Soil and drain pipes should only be large enough to do the work required of them.

Second.—Proper fall. In some instances buildings have good soil pipes and drains, but have poor connection to main sewer in street, thereby spoiling the entire job.

For a private house or dwelling not over two stories in height, and containing not more than two toilets and six small fixtures, a three-inch pipe is large enough. Soil pipe and drains to be installed as straight as possible, without quarter bends or offsets.

For ordinary work in rented houses, I consider four-inch pipe desirable, for the reason that it would not be so liable to stoppage. In fact, I would recommend four-inch soil pipe for apartment houses or all buildings that do not contain more than twelve toilets, or sixty fixtures in all, including small fixtures.

Sink Drains.—The sink drain, as a rule, causes more trouble than any other drain. If sinks are connected direct to soil pipe little trouble, if any, is caused by stop-

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*Presented at the 1909 annual meeting of the American Society of Inspectors of Plumbing and Sanitary Engineers.

page. Where sinks are connected to long horizontal runs, especially where drains run underground, sink drains stop up on account of grease chilling on sides of pipe.

Venting.—All vents should be vertical, or, in other words, "rough vented." No horizontal vents should be installed either for small fixtures or toilets, and "crown venting" should be prohibited. Instead of increasing vent, say, from one and a half inches to two inches, branch the vent into stock on "Y" below the lowest fixture and run full size. This would take care of condensation, scales, etc. (See drawing.)

Clean-outs.—Clean-outs should be placed at the base of all stacks, as well as at the end of main running line. Same should run above basement floor, so that they cannot be used for floor drains.

I believe the simplest and best way to put in a clean-out at the base of stack is to use a "Y" and one-eighth bend, using the one-eighth bend on the running line, then "Y" into one-eighth bend, using branch of "Y" for stack and the end for clean-out.

This is impossible in some cases on account of location being in a corner or too close to wall. Then the best result is attained by using one-eighth bend on running line of "Y" for stack and branch of "Y" for clean-out. In this way you have the clean-out in a good location and easily accessible.

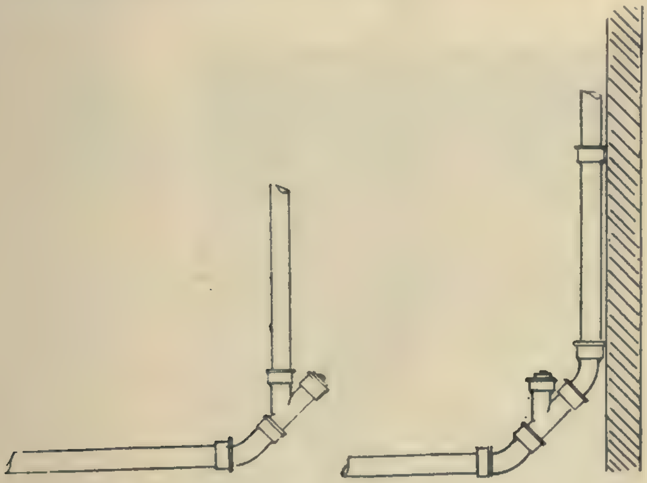


Fig. 3.

Proper Construction of Tanks

The success of a plumbing installation depends very much upon the proper construction of the tanks for supplying the water used by the household. The practical plumber fully realizes this and will see to it, not only that the tanks are constructed in the right way but that they are located where they will render the best service.

A boiler or attic tank is intended to hold water for the use of the household and to always maintain an even and constant supply for the range boiler. Such a tank should have a capacity at the rate of 25 gallons per day for each person in the house. The house tank should be lined with tinned copper and should weigh 16 ounces to the square foot. The tinning should be put on the copper with resin, that coating being the most permanent. Tinning copper with acid solution leaves the surface brighter and cleaner when new, but the solution is apt to be too strong, often eating away the tin or lead in the solder mixture and leaving the copper surface exposed. When such exposure occurs the action of the water on the bare copper soon causes a green coating, or verdigris, to form, and as this is poisonous, it will affect the water dangerously.

A tank should not be large enough to allow the body of water to become stagnant. The needs of the household should be ascertained and the tank be made of the size adapted to such needs, and a complete change of its contents should be made every day. An overflow should be provided adequate for the escape of a large flow. The diameter should be at least twice that of the inlet and determined by the pressure at the tank level.

The tank may be supplied with water either by pump, street pressure or hydraulic ram. If the street pressure is sufficient to raise the water to the tank level an automatic ball cock should be attached. This valve will prove useful when the supply is constant and the demand intermittent. The action of the ball cock is as follows:

A ball of copper or hollow spherical cylinder of glass attached to a rod working a piston in the shell of a faucet floats on the surface of the water and if the water is drawn lower the float falls with it and opens a fixture that is connected with a valve controlling the flow of water from the street pressure. When the float drops the piston opens the valve, allowing the tank to refill, and as the float rises it gradually closes the waterway and only the amount used is allowed to enter the tank. If a ram, with its outlet over the tank, is used an overflow is most imperative, as the ram is constantly forcing water through the open end above the tank.

If a pump is employed to supply the water a strong, durable force pump should be used, and the suction and rising pipe, or main, should be of the same internal diameter. If the rising main is of less diameter than the suction less water will be delivered and the strain on the pump will be greater, causing the working parts to require constant repairs. With a pump some means of ascertaining when the tank is full are necessary, as an overflow would not notify the operator unless a pipe is brought from the tank to the pump. A small pipe is usually installed, called the "tell-tale," and discharges over the sink in full view of the operator.

A tank should have a stop cock near it to control the supply to the fixtures. An air pipe should extend over the tank and attach below the stop cock on the feed pipe. A tank should be regularly cleaned, and a standing overflow should be provided to assist in this operation. An expansion pipe from the range boiler should extend above and over the water in the tank, to allow for undue heating of the water in the boiler and act as a safety valve, preventing the collapse of the boiler by admitting air when the boiler is emptied for any reason.

Up-to-date Plumbing System

The subject of sanitation is receiving more attention to day than at any previous time in the history of architecture. The increased size of living rooms, the provisions made for ample light and air, and the introduction of ventilation in connection with the heating system have done much; but more particularly there has been a wonderful improvement in plumbing, both in regard to the drainage system and to the water supply.

Improvement in workmanship, materials and installation have so changed the character of plumbing that new standards of comparison are required to determine the quality of work.

Humor has been given us by nature as an antidote to self-consciousness.

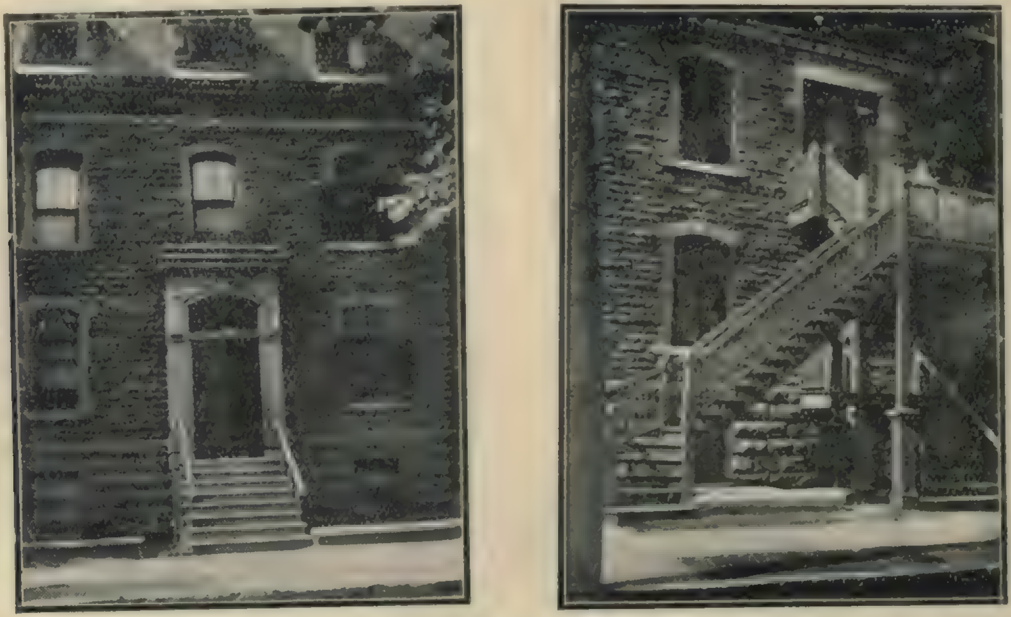
The Construction of Modern Sanitary Dwellings

Defects to be Avoided and Principles to be followed. — Practical Suggestions by Dr. Elzear Pelletier

(Continued from last issue.)

An example of the transformation of sanitary dwellings into unsanitary ones is given in figs. 21 and 22. Fig. 21 shows a sanitary dwelling, as originally built for one family; fig. 22 shows the same dwelling remodelled to shelter four families.

The staircase with which the front of this house has been muffled up probably constitutes the best known example of adaptation, to human dwellings, of the style of architecture of white mice cages. A dwelling with such a glaring and vulgar sign-post could not help but contain absurdities; and there they are to be found. The dining-rooms communicate openly into the water-closets (non disputandum de gustibus!), a dark room is used as a kitchen for one of the four dwellings. In spite of all, the proprietor is proud of his achievement!



Figs. 21 and 22.—Sanitary dwelling remodelled into unsanitary dwellings.

It is time that the municipalities should control this remodelling of dwellings. If they do not effect the disapearance of unsanitary houses which have been erected until now, they should, at least, prevent the transformation of sanitary dwellings into hovels.

Even if it were only for the sake of economy, one should, in building a house, take the necessary steps to prevent its being damp. An Italian author estimates that the waste of fuel in heating a damp house may amount to 50 per cent. in some cases. Indeed a damp wall becomes an excellent heat conductor, and, consequently, part of the heat developed by the fuel escapes outside of the heated premises, and is a total waste.

Moreover, a continuously damp wall rapidly disintegrates, not only the mortar, but the stone and brick likewise; the frost, in winter, greatly contributing to the dissolving action of the water in this destruction of the walls.

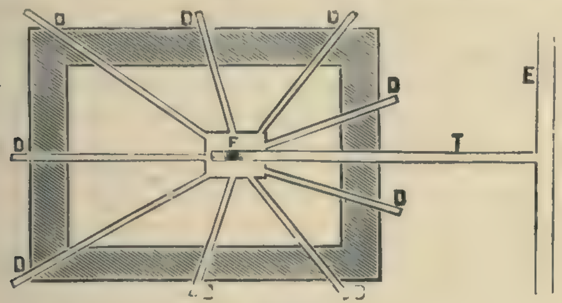
The causes of the dampness in houses are: (a) leaking roofs; (b) roof gutters emptying on the ground close to the foundations; (c) accidents to the plumbing; (d) dampness arising from the earth on which the building stands. We could add (e) recently laid plaster.

It is useless to dwell upon all these causes of dampness. In most cases the tenant will insist upon the repair of the roof and the plumbing. As to the plastering still too freshly laid to allow the occupation of the house, one would only have to wait to enter it, until the mortar does not contain more than 1½ per cent. of water (limit tolerable, according to Lehman). The ascertaining of the quantity of water in the mortar should form part of the routine work of the Municipal Board of Health, who have a chemical laboratory at their disposal. Finally, it is easy to connect the roof gutters with the drainage system of the dwelling.

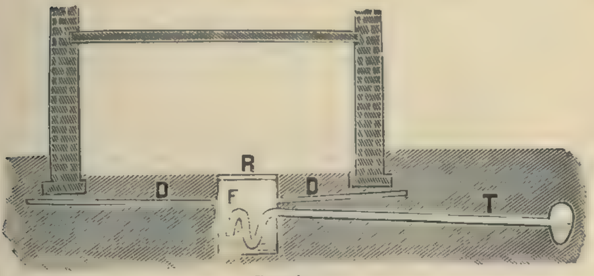
There remains the dampness arising from the earth upon which the building stands. To suppress this cause of dampness, while putting up a building, is such an easy matter and of such a low cost, and, on the other hand, it can become so difficult and costly when it is necessary to remedy the omission once the house is erected and delivered, that we are daily astonished to witness the greater number of architects omitting this precaution, and simply often laying the foundations in the water, without attempting anything to prevent its rising into the walls by capillarity. We know not, however, of any cases where the damp courses hereafter described could be dispensed with. Every spring and during the autumn rains, all soils are damp for a month at least.

By what means is it possible, during the construction of a house, to guard against the absorption of water by the foundation of walls?

(a) If the footing of the foundations is below the ground water level, or if the soil is naturally damp, it is useless to count upon having a sanitary house, without previously lowering the level of the water, namely without having drained the soil which the building is to cover.



Plan.

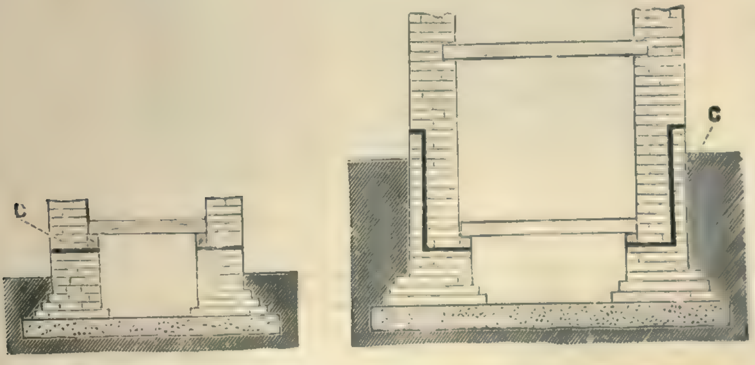


Section.

Fig. 23 and 24.—Drainage of the soil of a cellar. D D, porous drains converging to a collecting pit F, from which the water escapes, by the pipe T, in the street sewer E.

Many cellars, which were cemented without the level of the water having been lowered, have had the slight success which a good architect should have anticipated. (We have seen one of these cellars with an inch of water over the surface of the cement.) If the building is isolated, that is, free on all sides, a porous drain (in agricultural tiles, or in stones) surrounding the building and discharging on a slope of the ground (or connected with the street sewer, should there be no slope in the neighborhood) is the best method. Should the house form part of a block of houses the agricultural tiles are made to converge towards a collecting cistern-pit, connected to the street sewer by a water-tight pipe provided with a deep hydraulic seal (18 inches), so as to prevent the air of the sewer escaping through it. (See figs. 23 and 24).

(b) Concrete constitutes the best footing for the walls of a foundation. Without being impervious, it is considerably more waterproof than masonry; consequently we always recommend its use, whether or not the drainage of the soil spoken of in the preceding paragraph has been previously made. As a rule our builders only have recourse to this concrete footing in the case of foundations for heavy structures; hygiene demands it for all buildings.



Figs. 25 and 26.—Damp courses, lettered C, preventing the rise of water in the walls, by capillarity.

(c) Damp Courses in Walls.—They should never be omitted when laying the foundations of a structure. Made at that time, they add but little to the cost of the undertaking; while, once the building is completed, it becomes very difficult to make up for their omission, as we shall see later in speaking of the means of suppressing dampness in cellars of existing buildings.

These damp courses prevent the water from ascending into the walls. Asphalt constitutes the best damp course; one-half to three-quarters of an inch in thickness suffices. Slate and enamelled tiles (two rows imbedded in cement) are sometimes used, and more seldom sheets of lead and panes of glass. Slate may break at intervals if the house *works*, consequently its use is decreasing. Tarred felt is worthless, despite what some builders persist in saying about it; it is a known fact that it decays with time.

The damp course must cover well the whole width of the foundation walls. It is inserted below the first floor, and, if there is a basement, it is carried up inside the wall so as to reach the outside of the wall six inches, at least, above the ground surrounding the building. Figs. 25 and 26 show the different disposition of the damp courses in dwellings, whether with or without basements.

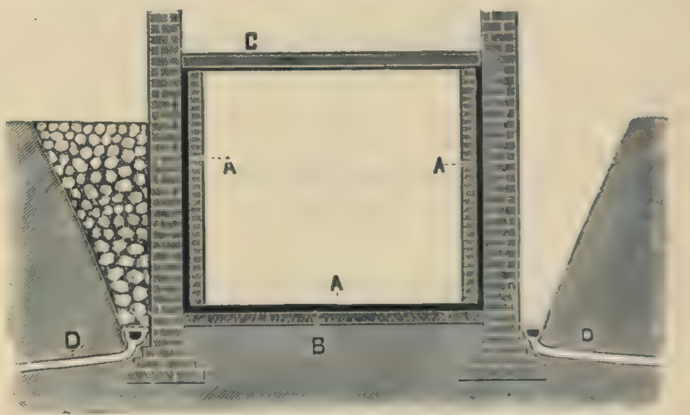


Fig. 27.—On the right the open area; on the left, area filled with pebble-stones. A A A, asphalt damp course. B, concrete. C, ground-floor. D, D, drains preventing the water from remaining in the bottom of the "area."

(d) Finally all the surface of the cellar is covered with a layer of concrete at least six inches thick; which may be, with great advantage, recovered with a layer of asphalt three-quarters of an inch thick.

In the case of a house already built, without any of the previously described suggestions having been followed, what can be done to suppress the dampness of the cellar or basement?

The first thing to do is to provide for the evaporation of the water contained in the foundation walls. This is obtained by keeping the wall constantly aired, both its outside and inside surfaces. Outside, the damp earth surrounding the wall is removed, so as to provide an open area, or if the area cannot be left open, it is filled in with pebble-stones, clinkers, etc. (see fig. 27), which maintain, through the spaces between them, a free circulation of air over the surface of the wall. Inside, it must be provided for a constant aeration of the cellar, or in the case of a basement without any cellar so to speak, for a constant ventilation of the space between the basement floor and the ground beneath. The best means to adopt, in winter, for this aeration or ventilation of a cellar is to utilize the heat of the house chimney to produce the exit of the air, as shown in fig. 28. The entrance of air into the cellar is secured by means of pipes, also shown in fig. 28. In summer, the aeration of the cellar is secured by opening the vent-holes of the opposed walls.

Second, the foundations must be prevented from being water soaked. For this, the ground covered by the foundations and, at the same time, the whole cellar should be drained. We have already shown how to carry out this drainage, both in the case of an isolated house, or of one forming part of a block of houses.

If, after having ventilated the cellar to facilitate the evaporation of the water from the walls (first recourse) and having drained the soil (second recourse), the dampness has not been remedied, it becomes necessary to have recourse to the supplementary measures which we shall presently describe.

Third, impervious "damp course" isolating the cellar, both from the damp subjacent soil and the damp walls which surround it. To cover the ground, it is only necessary to cement and asphalt the cellar, as we have recommended. For the isolation of the damp wall the following process, which Middleton recommends, seems to be the best one. The seams on the internal surface of the wall are first cleaned, so as to give a better hold to the water-proof layer (damp course) which will be spoken of. Then after having placed against the wall a board three-quarters of an inch thick (namely, the thickness which the water-proof layer will have) the board resting, by its lower edge, on the asphalted floor of the cellar, three rows of bricks are laid along the free surface of the board. The board is then removed and the space that it occupied is filled with molten asphalt. This cavity being filled, three other rows of bricks are laid, using once more the board as a guide, as previously, and the process is continued, three layers of bricks at a time, till the vertical asphalt layer covers the whole height of the cellar-wall. Fig. 27 shows the earth of the cellar covered with concrete and asphalt and also the vertical asphalt layer, applied to the wall in the above described manner.

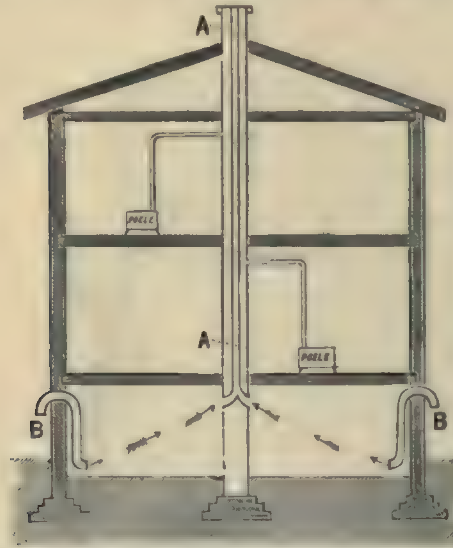


Fig. 28.—The Central Compartment A A of a Triple Flue Chimney is used to secure the escape of cellar air. BB, pipes conveying fresh air into the cellar.

The object of this vertical asphalt layer is to prevent the evaporation from the damp wall from taking place within the cellar. The evaporation is forced to the external surface of the wall, the evaporating power of which is increased by the "area" shown in fig. 27.

This vertical asphalt layer is always to be recommended in the case of an isolated house, all the walls of which are free exteriorly. But in the case of a common (mitoyen) wall, if the asphalt layer were placed on one side, it would force the evaporation to take place in the neighbor's cellar. And, if the neighbor, following the example, also places a vertical asphalt layer on his side of the wall, then the dampness of the wall would be, as it were, canalized between the two vertical layers, with the result that evaporation would no longer take place in the cellar, but higher up in the wall, namely in the rooms over the cellars in both houses, and this would aggravate the evil instead of remedying it.

Fourth, what we are about to describe suits for any wall, whether it be an exterior wall or a common (mitoyen) wall. The idea is to supply the deficiency of the damp course omitted during the construction of a house, by a damp course made afterwards. According to Keim, the process has been used successfully in Germany. We borrow from Keim the description of the process:

"As close as possible to the bottom of the wall, and in a horizontal line, holes are drilled ten inches apart; afterwards, to each side of the wall, at the level of the holes, fire boxes with air blasts shown in fig. 29, are applied. When the wall has become dry and, being still very hot, its power of absorption is considerable, the fire boxes are removed, tubes are tightly fitted to the openings, and by means of a force-pump bitumous oil is injected into the wall. Should it be impossible to procure the fire boxes with air blast shown in fig. 29, the drying of the wall may be attempted by means of the well known coke basket, shown in fig. 30.

Municipalities do not exact the enforcement of the provincial by-law: "forbidding to build on land that was used as a dumping ground, unless the whole surface which the house is to cover has previously been covered with concrete."

Old dumping grounds are real cemeteries, where animal and vegetable organic matters, undergo the putrefaction which effects the mineralization of those substances. Until such mineralization is complete—which takes several years—if a house be built over a dumping ground without any precaution having been taken to isolate it, by a layer of concrete (shown in fig. 27), the

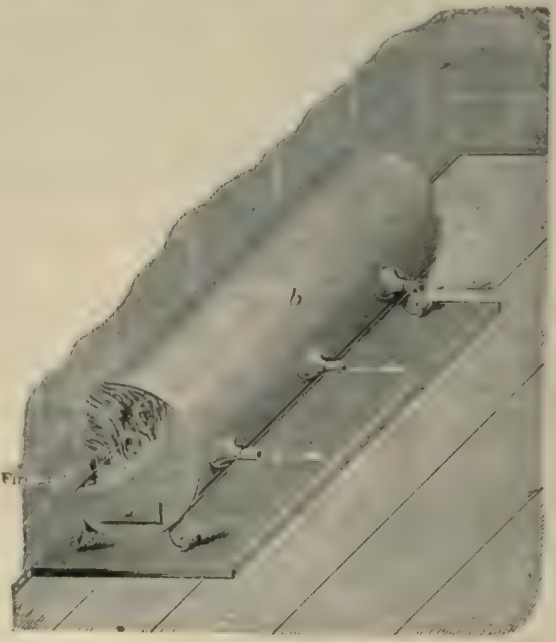


Fig. 29.—Fire Boxes with Air Blast.

gases arising from the putrefaction find their way into the house and contaminate the air. The contamination of the air is increased during the winter; the air of our dwellings is then in greater part renewed by the air coming from the soil, owing to the air suction produced by heating.

Real estate speculations have greatly increased the number of houses built upon old dumping-grounds. Sometimes people buy worthless lands (ravines, etc.) which they hastily have filled by the scavenging department service of the cities, and then advertise as "fine building lots for sale, a chance for the honest workman to own his own home." Sometimes large areas of land are first worked as quarries, then the stone having been removed and sold, is replaced by garbage, which our cities, lacking sufficient incinerators, are only too eager to cart thereto free of charge. If the lots do not sell, the speculator himself builds without an isolating layer of concrete, of course, and, owing to the fresh appearance of the new structures, tenants are immediately found, who do not in the least investigate the pedigree of the soil upon which they stand.

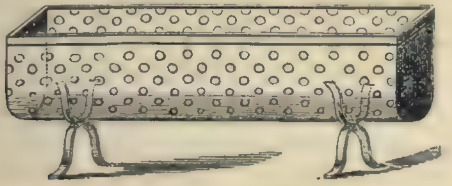


Fig. 30.—Coke Basket.

To control building operations, a city should:

1. Give to the municipal architect (a position which remains to be created in the greater number of our cities and towns), all the necessary powers to reject, such plans and specifications submitted to him, as do not comply with the requirements of the provincial and municipal health by-laws, and thus render this officer responsible for the enforcement of those by-laws.

2. Appoint a "commission on unsanitary dwellings," whose functions will be to seek the unsanitary dwellings, to order: either their being made healthy, or their suppression, when they are not susceptible of sufficient improvement.

3. Create the "sanitary docket of houses," the only means of knowing the sanitary value of all the dwellings in a municipality, and thereby of systematically supervising their being rendered healthy.

4. Finally, obtain an effective "expropriation law for cause of unhealthiness," which, like the English law of 1890, would allow the indemnity, to be granted to the owner of the property, to be based on the sanitary value of the property, and not on the revenue which the owner derives from it.

Pat had got hurt—not much more than a scratch, it is true, but his employer had visions of being compelled to keep him for life, and had adopted the wise course of sending him at once to the hospital. After the house surgeon had examined him carefully, he said to the nurse:

"As subcutaneous abrasion is not observable, I do not think there is any reason to apprehend tegumental cicatrization of the wound."

Then, turning to the patient, he said quizzically:

"What do you think, Pat?"

"Sure, sir," said Pat, "you're a wonderful thought reader, doctor. You took the very words out of my mouth."

Rules for Wall Papering

A single roll of the ordinary wall paper is 18 yards long by 18 inches wide, and a single roll of ingrain, felt or cartridge paper is 8 yards long by 30 inches wide. A single roll of one-strip border is 8 yards long by 18 inches wide and contains 8 yards of border. A single roll of two-strip border is the same length and width and contains 16 yards of border. Common wall paper is put up in double rolls, and ingrain, felt or cartridge paper is put up in triple rolls. Prices are quoted on single rolls. To determine the quantity of paper required to cover a room, multiply the height of the room by the length of the four sides and divide by 36, which will give the number of single rolls required. For each single roll of common paper 1⅛ yards of border will be necessary. For ingrain, felt or cartridge paper, multiply the height of the room by the length of the four sides and divide by 40, which will give the number of single rolls required. Multiply the length of the ceiling by the width and divide by 36 for common paper, and by 9 for ingrain, felt or cartridge paper, to obtain the quantity of single rolls required to cover the ceiling.

Concrete Ice Houses

The "Farm and Home" calls the attention of farmers to the fact that on dairy farms where a permanent ice house is desired, a concrete structure will prove economical. The first cost is slightly greater than where wood is used, but the ability of the concrete to stand constant dampness on the inside makes it more desirable. The building should have an opening extending from surface of the outside ground almost to the gable, which will allow ice to be put in. A small window for ventilation should be put at the top of each gable. The walls of this house may be constructed double by inserting a mould between the forms when the concrete is poured. Two three-inch walls with a two-inch air space will serve best. The roof may also be made of concrete by laying forms for rafters and reinforcing it with light iron rods.

For Rapid Repair Work

A sack of Portland cement is a very useful thing to have for making quick repairs. A hole in a drain pipe can be stopped in a few minutes with a little cement, mixed with water as thick as putty. A crack in a barrel can be stopped in this way. Hardwood floors may be patched and nail holes filled so that they will not leak. A waterproof floor can be laid over an old floor in a short time. Sweep the old loose boards. Cover with a layer of heavy wire netting, tacking it down occasionally. Over this lay a layer of concrete of one part Portland cement, three parts clean sand, mixed with water to a thin paste. Smooth thoroughly, but if it is to be used by stock, brush with an old broom to make it rough, then let it dry thoroughly before using the floor. Gutters may be put in where necessary. Holes in an old shingled roof can be quickly stopped by forcing a little cement putty through the shingle where the leak appears.

Apropos of labor matters—"I pick my men," said a Toronto contractor the other day, "and they are all good workmen. If I lose them it is just probable that I won't be able to get men that will do the same amount of work and do it as well. It is important that we should retain our men because when we figure for work we know just how much the men we have can do. If we had to put up with poor men we would lose on the contract."

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

578. Fencing wire and wire nails.—A large South African firm wishes to have quotations from exporters of fencing wire and wire nails.

569. Wire nails.—A large South African firm asks for quotations from exporters of wire nails.

600. Closet seats.—A Manchester firm asks for prices of closet seats from Canadian manufacturers.

490. Agent.—Reliable purchasing agent wanted in Montreal, Quebec or Toronto for Scotch firm of ironfounders manufacturing Canadian and American soil pipes, water pipes and other sanitary goods, etc.

495. Portland cement.—A Scotch firm desire to correspond with buyers of Portland cement.

500. Plumbers' supplies.—A Glasgow firm of contracting plumbers desire to make a connection with Canadian wholesale manufacturers of baths and plumbers' supplies with view to buying.

675. Machinery.—A north of England firm manufacturing concrete block-making machines, concrete head and sill making machines, concrete tile making machines, concrete mixers, power tampers, pallets and accessories wishes to open up business in Canada.

678. Bricks and blocks.—A west of England firm manufacturing acid proof and fire-resisting bricks and blocks is desirous of being placed in communication with Canadian importers of such goods.

679. Iron, steel, metals, etc.—A London firm of iron, steel and metal merchants wishes to form a connection in Canada, and would like to work with a reliable firm in the Dominion dealing in iron, steel, metals, machinery and hardware.

684. Slates.—The London office of a Belgian firm is desirous of obtaining a market in Canada for the sale of cement roofing slates.

Methods of Finishing Hardwood Floors

The extent to which hardwood floors are being used in dwelling houses and other buildings at the present day lends unusual interest to the methods of finishing them so as to give the most satisfactory results considering the purposes for which the rooms are to be used. A correspondent recently asking as to the best method for finishing oak, maple and other floors in the natural so that the wood will not darken, and if there is any way of bleaching hardwood floors that have been treated with linseed oil and become very dark with age, "The Painters' Magazine" suggested the following treatment:

Oak floors require a filler, if good smooth finish is desired in the natural, no matter what material is used. Maple does not require filling. For oak floors a good mineral paste filler and two light coats of grain alcohol shellac varnish, or in place of the latter, waxing frequently with a good floor wax will keep the floor from darkening. Ordinary floor varnishes or linseed oil will produce darkening. Mineral oils tend less to darkening of wood than linseed oil, but are not to be thought of for use in dwelling houses or public halls on floors, because of the tendency to soil the ladies' dresses. For maple floors three coats of grain alcohol white shellac varnish or repeated treatment with floor wax will not darken the wood.

As to the question about the bleaching of floors that have been oiled and become dark, the only remedy we know of is to remove the oil with a paint and varnish remover and then treat the wood with a strong concentrated solution of oxalic acid or by the use of bleaching powder. The use of the last named, however, is liable to be injurious to the health of the operator, and we would not recommend its use. The oxalic acid solution, while poisonous, is harmless when used with care.

Montreal Builders' Exchange Expanding

The Montreal Builders' Exchange has entered into its new premises, having leased the entire top floor of the Eastern Townships Bank Building, corner Victoria Square and St. James street. In addition to enlarged quarters for its members, reading room, board room, architects' consulting room, and members' private room, the directors have decided to set apart a roomy space for desk accommodation for such members as possess no down-town city office. This will be a great convenience for out-of-town firms having a Montreal agency. The Master Plumbers' Association will henceforth make their headquarters with the Builders' Exchange, where their secretary's office will be located. The master painters and electrical contractors are already in close relationship with the general Builders' Exchange. The special new departure will consist in the department of permanent exhibits, for which the directors have laid out some 3,500 feet of floor space, an entirely new feature for Canadian builders' exchanges. Here it is proposed to exhibit building materials of every description, so that architects' clients and prospective home seekers can see the latest material and improvements in building construction. The leading architects of the Province of Quebec Association have unanimously endorsed the scheme, and promised it their support and patronage. Already the bulk of the space has been rented, leaving only a few exhibits still available. This new development of the Builders' Exchange will doubtless prove of much usefulness to all connected with the trade, and make the Master Builders' Association an important factor among the institutions of Montreal.

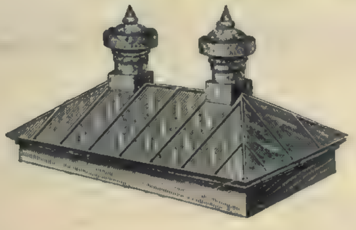
Another Market for Canadian Cement

The Dominion Gopernment Trade and Commerce reports contain the following from New Zealand:

"A Canadian newspaper states that a cement works in British Columbia is unable to find a market for its product if worked throughout the year. New Zealand should be a natural market for the cement produced in these works. As the result of a preferential duty of 2s per barrel in favor of cement made in Canada as well as in Great Britain, nearly the whole of the importation comes from the United Kingdom. The importation in 1907 amounted to 223,037 barrels. The difficulty confronting the trade from Canada is the higher cost of production and the higher freight charged. It is possible that the facilities, which the British Columbia company has, may enable it to meet the cheaper labor conditions of other countries. As it is situated on tide water this, too, ought to facilitate a low rate of freight, and it may be possible that, under the new arrangement of the steamship lines, freight sufficiently low can be had, to enable the company to get into the market and keep its establishment working all the year round.

The total value of buildings for which permits were taken out in the city of Toronto during last month is $1,887,532. Permits for May, 1908, represented a total value of $1,216,982.

Metal Skylights



Our ACORN System of Skylight Construction gives the greatest strength and the maximum of lighting surface, at the same time. We can quote tempting prices on these Skylights, which have been used on some of the largest jobs in Canada.

Write us about our ACORN system, and we will send you literature telling all about our Skylights.

Metal Shingle & Siding Co.
Limited
Preston and Montreal

"Galt" Expanded Steel Lath

"Not the First Lath but the First Perfect Lath."

Fireproof, non-plaster-staining, providing a flat plastering surface, free from bags and bulges.

"GALT" Lath is very rigid. Easily applied and plastered. That architects, contractors and plasterers appreciate these features the wonderful sale **"GALT"** Lath is enjoying proves. Prices and samples cheerfully furnished.

The Galt Art Metal Co., Limited
Galt - Ontario

Winnipeg	Winnipeg Supply Co.
Toronto	W. D. Beath & Son
Vancouver, B. C.	Morrison & Morrison
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Calgary	The Standard Supply Co.
Montreal	Wm. McNally & Son
St. John, N. B.	Estey & Co.
Hailifax	General Contractors Supply Co.

A Plain Talk About Profit
FOR CONTRACTORS

The ribs in Herringbone Lath act as stiffeners and allow the spacing of furring strips to 16" on centers instead of 12". Suppose you are using 1½"x 1" strips costing $50.00 per M. in place. One square yard of strips 12" on centers costs 7.5 cents. At 16" on centers they cost 5.62 cents. The difference is profit for Herringbone users.

On ceilings you can put the Herringbone directly on the joists and the cost of furring then becomes all profit.

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GENERAL SALES AGENT
117 HOME LIFE BUILDING - TORONTO
Metal Shingle & Siding Co., Manufacturers

D. L. Standard Metal Lockers

"The Lockers of Quality and Service."

A modern necessity in Factories, Stores, Banks, Offices, Gymnasia, Colleges and Public Institutions.

D. L. Standard Lockers
are distinguished by their
Finished Appearance
Security — Strength
Durability

They are made of sheet steel, with expanded metal or solid steel doors; key or combination locks; solid steel partitions and backs. D.L. Standards are the best locker value ever offered in this country.

Send for special booklet.

Dennis Wire & Iron Works Co.
Limited
London - Canada

S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

CANADIAN PIPE COMPANY LTD.
HEAD OFFICE VANCOUVER B.C. P.O. BOX 915.

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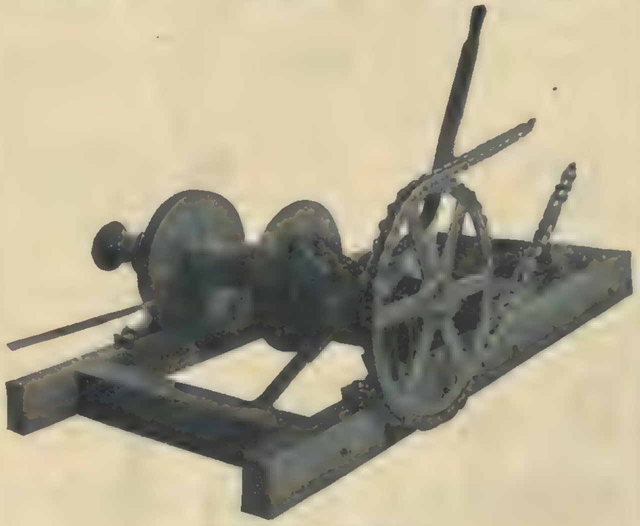
FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The "London" Hoist

Friction Clutch

SIMPLE - DURABLE - INEXPENSIVE



Size 40 inches by 8 feet.

Designed and perfected for use with any style or size of engine. It is complete with our powerful "London" Friction Clutch and a brake of band type with foot lever and rachet.

Catalogue 21 G

The Scott Machine Company
Limited
Engineers and Machinists London, Canada

Towns
and
Cities

making extensions to, or installing systems of Water Works, should send us their inquiries regarding Hydrants, Valves and Valve Boxes.

We are specialists in the manufacture of these goods and our prices are right.

The Kerr Engine Company
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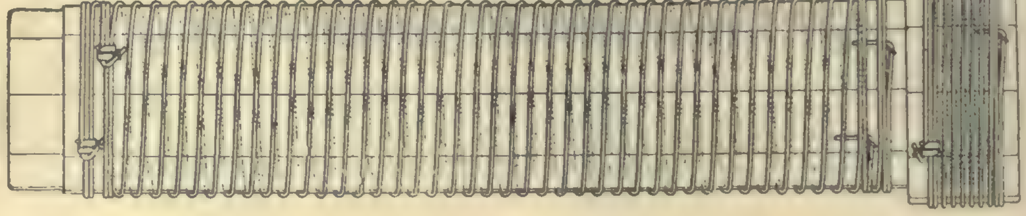
WALKERVILLE, Ontario



End View of Pipe and Coupling.

The Dominion Wire Wound Wood Water Pipe

Showing special method of winding with two independent parallel wires. The great advantage of this is that in event of one wire becoming damaged the pipe still retains a factor of safety of 2.5. Made only by

The Dominion Wood Pipe Company, Limited New Westminster, B.C.

Also Manufacturers of Continuous Stave Pipe for Irrigation and Power Purposes. Write for Catalogue.

JAMES THOMSON, President J. G. ALLAN, VICE-PRESIDENT, JAMES A. THOMSON, Secretary. ALEX. L GARTSHORE, Treasurer

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LIMITED

Manufacturers

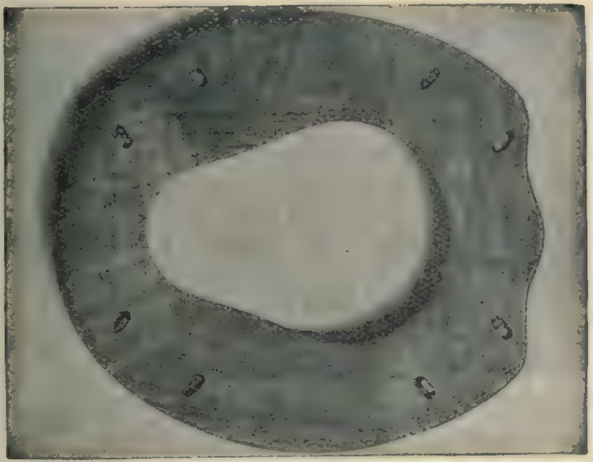
Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

HAMILTON, ONT.

THEY NEVER SPLIT



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Glue loses most of its adhesive power in time when subjected to widely uneven conditions of moisture and heat. This fact is responsible for the production of "NEVER SPLIT" SEATS. This seat, of which we hold the Canadian patents, is held together by bolts, nuts and washers imbedded in the wood.

No wordy argument necessary to impress on any practical mind the advantages of this method of closet seat construction. Write for catalogue on sanitary woodwork.

We sell only to the jobbing trade. It will be to your interests to specify our goods when ordering.

Goderich Organ Co., Limited Goderich Canada

Selling Power

Selling Power can be added to a building by furnishing with attractive

Mouldings

Architects and Contractors should not lose sight of this fact when specifying and constructing. The small cost is amply repaid and the general appearance improved.

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Complete catalog mailed upon request.

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Our Roadway Stone is best on the market for Roadway Work, having those Qualities esssential for this Class of Work.

Prompt Shipment via C. P. R. and Grand Trunk.

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Head Office: **34 Yonge Street, Toronto**

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Base, Casings, Mouldings of all kinds, Hardwood and Pine Flooring, Doors, Sash and Frames

We are equipped and have the workmen to turn out the highest class of **Interior Work**—Stair Building, Panel Work, Grilles and Store Fittings.

Try us on Built Columns, Turned and Built Newels and Veneered Doors.

We supply material in assorted car lots, rough and dressed lumber, shingles and lath, and will gladly quote a delivered price on your requirements.

A card from you will bring a call from us

Georgian Bay Shook Mills, Limited
Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Arnprior, Ont.

Tenders for construction of concrete sidewalks will be received until June 28th by T. H. Grout, Town Clerk.

Assiniboia, Sask.

Tenders are invited until June 26th for 25,000 square feet plank sidewalks. Address, Frank Ness, St. Charles.

Barrie, Ont.

By-laws to raise $30,000 for a sewerage system in wards five and six and $10,000 and $3,000 respectively for cement sidewalks and sewer extensions have been carried by the ratepayers.

Fort William, Ont.

Tenders for repair and re-construction of dock are wanted until July 2nd. Address H. S. Hancock, city engineer.

Fernie, B.C.

Plans for a system of water supply for the city have been prepared by City Engineer Potter and accepted by the council. Tenders are called for July 2nd, and work will be proceeded with immediately. (See advertisement.)

Hickson, Ont.

Tenders are wanted until June 25th for construction of concrete sidewalks amounting to 8,000 square feet. Address R. extension of St. Paul's Presbyterian Nicholson, Hickson, Ont.

North Toronto, Ont.

The ratepayers will vote on July 17th on a by-law to raise $140,000 by debentures for the installation of a sewage system.

Newmarket, Ont.

The ratepayers have voted in favor of a by-law to issue $20,000 debentures for laying granolithic walks and road improvements.

Niagara Falls, Ont.

W. J. Seymour, city clerk, gives notice of the city's intention to carry out the construction of a number of concrete sidewalks, etc.

Oak Lake, Man.

Tenders addressed to R. H. Hockin, secretary-treasurer, will be received until June 30th for grading and laying granolithic sidewalk, 2,500 running feet more or less, and 200 feet of road crossing.

Oshawa, Ont.

The town engineer has submitted a report in connection with proposed paving work, involving a cost of $4,450.

Orillia, Ont.

The ratepayers have voted in favor of by-laws to raise $55,000 for sewage disposal work and $15,000 for sidewalk construction.

Ottawa, Ont.

Tenders are about to be called for a quantity of asphalt paving work.

Tenders addressed to N. J. Ker, City Engineer, will be received until June 29th for asphalt paving work on Slater street, Rideau street and Henderson avenue. Specifications at office of city engineer.

Selkirk, Man.

Tenders addressed to J. Partington, town clerk, will be received until June 28th for supply of wood and iron water pipe, respectively, hydrants and specials for a waterworks system. Also for excavating and back filling trenches for water mains. Plans and specifications and schedule of quantities at office of town clerk or at office of C. A. Millican, C.E., 428 Main street, Winnipeg.

St. Catharines, Ont.

City Engineer Benzie estimates the cost of the proposed sewer on York street at $7,200, and of that on Dacotah street at $1,080. The recommendation in favor of this has been submitted to the council.

Tillsonburg, Ont.

Tenders addressed to A. E. Raynes, Town Clerk, will be received until June 31st for construction of composition stone sidewalks on Tillson avenue, etc.

Toronto, Ont.

The following tenders were received for a centrifugal pump in connection with filtration plant: John Inglis Company, Toronto, $9,200; John McDougall Company, Montreal, $9,428.

Tenders addressed to F. Cochrane, Acting Minister of Public Works, will be received until July 2nd for construction of a wagon road from the Montreal river at Smythe to Gowganda. Plans may be seen at the Department.

The City Engineer has recommended the construction of sewers on the following streets in the recently annexed district of Bracondale, at an approximate cost of $102,590: Davenport road, Spadina road, Walmer road, Lyndhurst avenue, Wells Hill avenue, Hillcrest avenue, Bayview avenue, Hillcrest avenue, Bathurst street, Markham street, Vaughan road, St. Clair avenue, Melgund road, Nina street, Austin Terrace, Kenwood avenue.

Victoria, B.C.

The ratepayers have sanctioned bylaws for waterworks, sewers and local improvements amounting to $225,000.

A considerable amount of sewer construction is to be undertaken this season. About twenty applications for extensions have been received, to construct all of which will cost in the neighborhood of $30,000. The most extensive work is that on Queen's avenue, and immediate neighborhood, which it is proposed to operate by a system of pumps. To install this system will, it is estimated, cost $11,700.

Vancouver, B.C.

Following is a list of tenders in connection with waterpipe supply: C. G. Johnstone & Company, City, steel, 6 inch 46½c, 8 inch, 71½c, 12 foot length; B. Robinson, Montreal, cast, 6-inch, 57, 8-inch 78; A. J. Forsyth & Company, cast, 6-inch 53⅓, 8-inch 77; Carne & Company, City, cast, 6-inch 55½, 8 inch 82⅓; Crane & Company, City, Matheson, 40⅞, 8-inch, 66 2-9; F. Hawkin, cast, 6-inch 54.80, 8-inch 80.75, 12 foot length; F. Darling & Company, steel, 6-inch 50, 8-inch 85, 20 to 36 foot lengths; Evans, Coleman & Evans, City, cast iron, 6 inch, 38.20, 8-inch 37.60, 2,240 pounds; Evans, Coleman & Evans, City, steel, 6-inch 45.25, 8-inch 70.10; P. Harris, steel, 6-inch 46¼, 8-inch 69¼; C. F. Jackson & Company, cast, 6-inch, 51.59, 8-inch 71.44 per lineal foot; C. F. Jackson & Company, cast, 6-inch 51.12, 8-inch 76.11; Robertson, Godson Company, City, steel, 6-inch 43, 8-inch 72.87; Robertson Godson Company, City, steel, 6-inch 42½, 8-inch 71.55; Robertson, Godson Company, City, flange joint, 6-inch 55.86, 8-inch 87.12; Robertson, Godson Company, City, 6-inch 54.25, 8-inch, 93.49; O'Neill & Company, cast, 6-inch 55.20, 8-inch 80.74 per 100 feet; O'Neill & Company, cast, 6-inch 56c., 8-inch 82c. per foot; C. W. Stancliffe & Company, cast, 6-inch 58¾, 8-inch 83¼ per 12 feet.

Waterloo, Ont.

Tenders will be received for cement curbing throughout the town. (See advertisement.)

Winnipeg, Man.

Tenders for a long schedule of granolithic walks will be received until June 23rd by N. Peterson, Secretary, Board of Control.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until June 28th for the construction of balanced, self-operating hydraulic sluice valves and connected machinery for the St. Andrew's Lock at Lockport, Man. Plans may be seen at the offices of J. G. Sing, resident engineer, Toronto; J. L. Michaud, resident engineer, Montreal; A. R. Dufresne, resident engineer, Winnipeg, Man., and at the Department of Public Works, Ottawa.

AWARDED.

Brantford, Ont.

The following are the prices submitted to the Board of Works by the Warren Bitulithic Paving Company for pavement:—Bitulithic standard, 10-year guarantee, $1.78, 5 years guarantee, $1.63. Asphalt, 10 years, $1.45; 5 years, $1.30. Warranted to be laid on Queen street only—10 years, $1.20; 5 years, $1.05. The city engineer was granted the contract for the laying of the concrete on George street, 1 yard five-inch base, to cost 45 cents.

The following contracts have been awarded: City Engineer, 48 cents a square yard for grading and concrete foundation; 45 cents per lineal foot for curb and gutter of George street pavement; Westrumite, Limited, top surfacing, $1.19 square yard; James Reid and James Mitchell for sewers on Scarfe street, Gilkinson street, Brant street and Oxford street for the lump of $7,800.

Estevan, Sask.

The Burridge-Cooper Company, Limited, of Winnipeg, have been awarded the contract for the waterworks system at Estevan. Contract price, $50,000.

Fredericton, N.B.
For the installation of a 15-inch surface drain a contract was awarded to Robert S. Low, of Sydney, C.B., at $412.70. The next lowest tender was $564.

Hamilton, Ont.
At a recent council meeting contracts for sewers were awarded as follows: Aurora street, 55 cents a foot; Clinton street, Andrew Mercer, 94 cents a foot; Emily street, S. Cheeseman, 60 cents a foot. Engineer's estimate, Aurora street, 68 cents; Clinton street, $1; Emily street, 90 cents.

London, Ont.
The tender of the Barber Asphalt Company for the pavement on Rectory street, amounting to $11,098, was accepted. City Engineer Gradon was awarded the contract for the Christie street tile sewer at $1,115.50.

Montreal, Que.
The Water Committee have awarded the following contracts for waterworks supply: Cast iron pipes, Canada Iron Company, Limited; special castings, P. Amesse & Company.

Oak Bay, B.C.
Contracts for the supplying of English cast iron water pipes have been let, R. Angus being the successful tenderer. The total amount involved is $15,952.30, that being the lowest tender of the four received. The following is the detailed list of tenders per ton: A. Sheret, 12-inch, $40.85; 8-inch, $41.05; 6-inch, $41.70; 4-inch, $41.35. Robertson, Godson Company, Vancouver, 12-inch, $40.75; 8-inch, $40.95; 6-inch, $41.60; 4-inch, $41.25. A. Angus, 12-inch $40.45; 8-inch, 39.75; 6-inch, $39.75, 4-inch, $39.75. W. G. Winterburn, 12-inch, $40.45; 8-inch, $41.15; 6-inch, $41.15; 4-inch, $42. The B. C. Foundry & Engine Works will supply the special castings, but the valves and meters have not yet been decided upon. The contract for the latter will be awarded in the near future.

North Bay, Ont.
The contract for construction of 50,000 square feet of cement sidewalk was awarded to Carr & Robertson at 13 1-2 cents per square foot. Other bids were: D. W. Mitchell Company 13 3-4 cents, and J. Small, 14 cents.

Peterborough, Ont.
Contracts were recently awarded in connection with improvements to the waterworks. The contract for the new concrete dam, pump house foundations, wheel pits, etc., was awarded to the Bishop Construction Company, of Montreal. The price was by quantities. The contract for one unit of pumps of 3,000,000 gallons capacity, with turbine, was awarded to the Wm. Hamilton Company, of Peterborough, the price being $12,900.

Smith's Falls, Ont.
The followings bids were received for 100,000 square feet of granolithic sidewalks: F. Dolan & Son, Belleville—Walk, 11¾ cents square foot; curb, 9 cents lineal foot; crossing, 16 cents square foot. Pruner & Company, Ottawa—Walk, 14½ cents square foot; curb, 9 cents lineal foot; crossing, 20 cents square foot. The tender of F. Dolan & Son was accepted.

Winnipeg, Man.
The tenders of the engineer of construction for asphalt paving of Henry avenue, from Chambers street, at $15,059.10, and also for asphalt pavement on Fort street, from Portage to York avenue, at a cost of $26,166.76, have been accepted.

The contract for the erection of pump house No. 7, has been awarded to Saul & Irish at $3,650.

Yorkton, Sask.
The contract for sewer extensions was awarded to the Municipal Construction Company, Regina, Sask., at $16,032. Other bids received were as follows: Holmes & Kinnomond, Portage la Prairie, $18,860; Jackson & Sons, Winnipeg, $19,150; McManus & Company, Winnipeg, $19,280; Western Contracting Company, Norwood, Man., $19,700; W. Newman & Company, Winnipeg, $19,920; Blight Fielder & Company, Moose Jaw, Sask., $23,050; J. L. White & Company, Sioux Falls, S.D., $23,700; McVean & Craig, Prince Albert, Sask., $19,700.

Railroads, Bridges and Wharves

Cobourg, Ont.
$50,000 has been voted by the Grand Trunk Railway for improvements here, to include a new station, freight sheds and additional accommodation in the yards.

Chalk River, Ont.
The C. P. R. are planning extensive alterations to their shops and yards at this place.

Matapedia, Que.
Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until July 9th for construction of approaches to the highway bridge across the Restigouche river. Plans may be seen at offices of resident engineer at St. John, N.B., Halifax, N.S., and Montreal, Que.

Montreal, Que.
Work on the new C. P. R. line from Thief River to Duluth will be rushed to completion. One hundred miles will be ready this year.

Ottawa, Ont.
The C. P. R. have been ordered by the Railway Commission to construct a tunnel under their line at the Iberville street crossing.

Prince Albert, Sask.
The C. N. R. have filed plans for the Shellbrook-Battleford line. The Hudson's Bay Pacific road have filed plans for their road from Prince Albert to Hudson's Bay.

Portage la Prairie, Man.
At a meeting of the Parks Board it was decided to build a bridge over the river in place of the old Smith bridge. Work will start at once.

Summerland, B.C.
H. Lang, provincial road superintendent, states that work will be commenced at once upon a new single-span bridge over the Okanagan river.

Tavistock, Ont.
A bylaw to take $10,000 stock in the People's Railway was recently approved by the ratepayers.

Toronto, Ont.
According to a press report a syndicate of New York and Boston capitalists is to take over the Bruce Mines and Algoma Railway, with a charter and Government grants, running from the north shore of Lake Huron to Hudson Bay. The projectors are heavy lumber producers, and will extend the road from its present terminus on into the great timber tracks of Ontario and the Northwest Territories.

The Ontario Bridge Company recently submitted to the city a tender for Dundas street bridge for street railway purposes. The figure was $42,000. The City Engineer recommended that the company be engaged to construct the new bridge at 4 45-100 cents per pound, the estimated quantity of steel in the bridge being 775,000 pounds. The matter is in abeyance.

Tenders addressed to Frank Barber, C.E., engineer for the townships of King and Vaughan, will be received until June 30th for the construction of a reinforced concrete arch over the Humber river. Plans and specifications may be seen at the office of the engineer, 57 Adelaide street east.

Engineer Cole, of the T. & N. O. Railway, is preparing plans and estimates for an extension of the line to Elk Lake and Gow Ganda.

Windsor, Ont.
In order to provide for a proper system of drainage of the Detroit River tunnel, it has been decided to drive another tunnel shaft the entire length of the Canadian approach, in which a four-foot pipe will be laid. This tube wil run about twenty feet below the surface from the opening of the cut direct to the river. Estimated cost, $100,000.

Winnipeg, Man.
The Government intend to erect at once a traffic bridge over the river at St. Andrew's Locks at an estimated cost of over half a million dollars.

AWARDED.

Fort William, Ont.
The contract for the wharf on Mission river, part of the Grand Trunk Pacific terminal, was awarded to Smith & Heney, Ottawa, at $300,000.

Vancouver, B.C.
The Canadian Bridge Company has been given a four hundred thousand dollar contract for the steel for six bridges on the G. T. P. H. Ferguson, of Toronto, was given the contract for the concrete work.

Public Buildings, Churches, Schools, etc.

Barrie, Ont.
The ratepayers have approved a by-law to grant a fixed assessment of $25,000 to the Barrie Tanning Company, who will extend their plant.

Beaverton, Ont.
The council will raise $7,000 by debentures for the erection of a school house.

Chatham, Ont.
Having failed to get Government aid the Council are asking the neighboring counties to assist in the erection of the proposed western asylum.

Collingwood, Ont.
Tenders addressed to W. A. Tom, chairman, Town Property Committee, will be received until June 28th for erection of an agricultural building. Plans and specifications may be seen at office of P. S. Palin, architect.

Edmonton, Alta.
Tenders for erection of high school are invited until July 10th by Roland W. Lines, architect, this city.

Estevan, Sask.
Tenders for the erection of a town hall close June 25th with L. A. Duncan, treasurer.

Fergus, Ont..

The following tenders have been received for the proposed Carnegie library building: Whole tenders — H. A. Clemens, Guelph, $10,465; John Moffat, Fergus, $10,227; G. A. Scroggie, Guelph, $9,210; R. D. Stewart, Guelph, $9,100; W. J. Hebden, Guelph, $8,875; John Moffat, (hot air heating), $9,102. Slating — Brown Bros., Brantford, $290. Carpenter work — John Moffat, $3,205; W. J. Hebden, $2,975. Electric wiring and fixtures — J. C. Noice, Guelph, $82; Davis and Wicks, Guelph, $60. Plastering — R. Withers, Guelph, $640; J. H. Hatch, Fergus, $635; Charles Hodges, Guelph, $630; J. J. Mahoney, Guelph, $627; W. Stafford, Elora, 30 cents square yard, cornice 40 cents. Plumbing—Mahoney Bros., Guelph, $330; M. McClanahan, Fergus, $307; Mahoney Bros., roughing only, $150. Hot water heating—Mahoney Bros., $1,350. Painting—Fred Trotten, Guelph, $575; Wm. Scriven, Guelph, $490; Reynolds & Son, Guelph, $485; Demsey Bros., Guelph, $450; Dennis & Bennett, Guelph, $435; Wm. McCulloch, Fergus, $435; D. F. Small, Fergus, $430. Galvanized iron work—H. Occomore & Company, Guelph, $69.75; G. C. Walcott, Guelph, $65; M. McClanahan, Fergus, $56; T. B. Kerr, Fergus, $42. Excavating, stone and brickwork — T. Wilkie, Fergus, $3,740; N. & A. Irving, Guelph, $3,000; Quinn & Wilson, excavating only, 60 cents cubic yard; cement floors, 7 cents square foot. Hot air heating, Jas. Smart & Company, Brockville, (Kelsey), $450.

Fort Wililam, Ont.

Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until July 5th for electric light wiring and fittings for the post office building. Plans and specifications may be obtained on application to W. T. Rankin, Clerk of Works, Fort William, and at the Department at Ottawa.

Hamilton, Ont.

An eight room addition will be built at the Barton street school. Estimated cost $40,000.

The court house committee has endorsed the recommendation for the erection of a new registry office and has sent on same to city council, with a proviso that the new building shall not cost more than $40,000. Plans have already been prepared by Stewart McPhie, architect, this city.

Infiersoll, Ont.

Tenders addressed to J. L. Patterson will be received until June 22nd for the erection of public library. Architects, Nagle & Mills, Ingersoll.

Killarney, Man.

A bylaw will be voted on in the near future to borrow $10,000 to build a town hall and police station at Killarney.

Matheson, Ont.

A new church will be erected here by the members of the congregation of St. Andrews Church, Perth.

Medecine Hat, Alta.

The St. Barnabas congregation have decided upon the erection of a new church.

Morinville, Alta.

A project for the erection of an undenominational church is under discussion here.

Montreal, Que.

The Congregationalists will erect a large new church at Point St. Charles.

The Joseph property has come into possession of the McGill University authorities, who will probably use same for a new gymnasium building and for an extension to the library. It is estimated that a new gymnasium, such as is required, will cost $175,000 to build. The matter is in quite an embryo stage.

New Westminster, B.C.

It is expected that tenders will shortly be called for the erection of the new Horse Show building, estimated to cost $8,500. Address G. D. Brymner, secretary of the association.

Orillia, Ont.

The ratepayers have approved a by-law in favor of converting the present public library into a free library. Mr. Carnegie has promised $12,500 for a library building in connection with this proposal.

Ottawa, Ont.

The Canadian Association for the Prevention of Tuberculosis invites competitive plans for a sanatorium for counties of Carleton, Renfrew and Lanark. (See advertisement.)

Outremount, Que.

The Roman Catholic Church of St. Viateur d'Outremount will erect a new church on Laurier avenue.

Portage la Prairie, Man.

Tenders addressed to F. C. Patterson, Chairman, Manitoba Government Telephone Commission, will be received until June 24th for the erection of a telephone exchange building in this city. Plans and specifications may be seen at office of Manitoba Government Telephone, Portage la Prairie, and at the Winnipeg office of the Commission.

Regina, Sask.

Tenders are invited for school furniture, supplies, etc., for collegiate institute. (See advertisement.)

St. Agathe, Que.

A consumptive sanatorium will be erected here by Mr. V. Lorne McGibbon, of Montreal, at a cost of $100,000.

Toronto, Ont.

The Board of Education invites tenders for erection of several school buildings, etc. (See advertisement.)

Tenders for all trades in extension of Victoria Hall, Queen street east, will be received until June 28th by E. J. Lennox, architect, 164 Bay street.

Tenders will be received by E. J. Lennox, architect, 164 Bay street, until June 28th for razing old buildings and for excavation work required in connection with the proposed new St. Paul's church, Bloor street east. Plans may be seen at the architect's office.

Tenders addressed to H. F. McNaughton, Secretary, Department of Public Works, will be received until July 5th for concrete foundation work in connection with the extensions to the Ontario Government Building. Plans at offices of G. W. Gouinlock, architect, 1108 Temple Building, city.

Vancouver, B.C.

The Y. W. C. A. have inaugurated a campaign to raise $35,000 for the building and equipment of a new wing.

Tenders are wanted for the erection of a temporary church for the Mount Pleasant Catholics. A commodious modern structure will be erected later.

Surveys have been completed for the new race track at Brighouse station, on the Lulu Island branch of the B. C. E. R. A $12,000 club house will be erected, also a large grand stand and modern stabling.

Victoria, B.C.

Tenders are about to be called for the erection of the new Moss street school.

The city engineer's department is preparing plans for a new incinerator to cost about $2,000.

A project for the erection of a large theatre in this city is under consideration. John Cort, of Seattle, is behind the enterprise. The cost of the proposed building has been estimated at $150,000. E. R. Ricketts, of this city, is making arrangements.

Vonda, Sask.

A large four-roomed school will be erected this summer to replace the building recently destroyed by fire.

Welland, Ont.

A new guild hall will be erected by Holy Trinity Church. Plans are being prepared by T. L. Nichols, arcihtect.

Winnipeg, Man.

Plans are being prepared by the Provincial Architect, S. Hooper, for the proposed addition to the court house. Estimated cost $200,000.

The City Methodist Mission Board have obtained a permit for the erection of a two storey brick kindergarten building, corner of Stella and Powers. Estimated cost $11,000.

Yorkton, Sask.

Tenders addressed to C. D. Livingstone will be received until June 25th for the erection of a brick Presbyterian church. Plans and specifications at office of J. N. Clark, Yorkton, and J. H. Russell, architect, Winnipeg.

AWARDED.

Elora, Ont.

Contracts for the new Carnegie library building have been awarded as follows:—Thos. Wilkie, foundation, stone work and materials, $360; W. H. Stafford, sr., brickwork and plastering, $2,475; Wm. Sheppard, carpenter work, $1,590; Jas. Smart Company, Limited, Brockville, heating, $215; A. R. K. Macdonald, galvanized iron work for roof and metal shingles, $210; Shafer & Gillespie, painting and glazing, $205. The question of lighting was left to a future meeting.

Moosomin, Sask.

The contract for building the high school has been let to Thos. Grayson of this place at $20,500, including heating.

Orillia, Ont.

Subject to securing the required sum from the council, the School Board have awarded contracts for public school work as follows: West Ward School — Wm. L. Bennett, building, etc., $4,379; Frank Toogood, painting, $265; Orillia Hardware Company, heating, $2,303; Phillips & Company, plumbing, galvanized iron work, etc., $1,292. South Ward School — Pease Company (per Phillips & Company), heating, $1,658; Orillia Hardware Company, plumbing and galvinized iron work, $665. Central School — Orillia Hardware Company, heating, $1,248; plumbing, galvanized iron work, roofing and eavetroughing on whole building, $896; The trustees regarded the tenders for lavatory at the Central school and basement and lavatory at the South Ward school as too high, and did not award any contract.

St. Thomas, Ont.

In connection with the new telephone exchange to be erected here, the successful tenderers were as follows: Masonry, brick work and reinforced concrete, A. E. Ponsford; carpentering, Green & Son; impervious floor, The Terrano Flooring Company, Toronto; plastering, W. J. Stewart; roofing, Ingram & Davey; plumbing, heating and gas fixtures, E. B. Dixon; electric wiring, Hamilton & Scott.

Springhill, N.S.

James Reed, of Digby, N.S., has been awarded the contract for the erection of the new school building. Cost $55,000.

Victoria, B.C.

The Westholme Lumber Company has been awarded the contract for the erection of the new provincial hospital for the insane. Contract price, $369,000.

Winnipeg, Man.

The contract for the erection of the new school on the Aberdeen grounds has been awarded to Brown & Barker, this city. Cost of building, $62,800, exclusive of heating and ventilation.

Davidson Bros., contractors, have received the contract for the erection of 34 stations along the N. T. R. lines. The work covers all the stations between Winnipeg and Fort William. The contract was originally awarded to J. J. Vopni but has been sub-let by him to Davidson Bros.

Residences

Toronto, Ont.

Recent permits, issued for residences, include: Mrs. Kemp, 2½-sty. brick dwelling, Walter street, $3,500; James Hussey, pr. 2-sty. brick dwellings, Gladstone avenue, $3,200; H. F. Squires, 3 att. and 1 pr. 2-sty. brick dwellings, Salem, $10,000; Commercial Brick Co., pr. 2-sty. brick dwellings, Lynd, $4,000; R. D. Hume, 2½-sty. brick dwelling, Roxborough avenue, $6,000; J. G. Shackleton, pr. 2-sty. brick dwellings, Heward, $5,000; Jas. Delworth, pr. 2-sty. brick dwellings, Follis avenue, $4,000; Walter Nash, 2½-sty. brick dwelling, Nanton, $3,600; W. Stubbings, 2-sty. and attic brick dwelling, Dovercourt road, $3,000; C. E. Proctor, pr. 2-sty. and attic brick dwellings, Palmerston avenue, $7,000; Samuel Crone, pr. semi-det. 2½-sty. brick dwellings, Westmoreland avenue, $5,000; H. Gaffney, 14 pr. semi-det. 2-sty. brick dwellings, $42,000; H. Galbraith, pr. 2-sty. brick dwellings, Grace street, $4,600; W. H. Harvard, 3 pr. 2-sty. R. C. dwellings, brick fronts, Pape avenue, $8,000; J. J. Walsh, pr. 2½-sty. brick dwellings, Spencer, $5,000; R. C. Bustard, 2 prs. 2½-sty. brick dwellings, Pricefield, $12,000; P. Hamblyn, pr. semi-det. 2-sty. brick dwellings, Dovercourt road, $5,000; A. Cross, 2 prs. 2½-sty. brick dwellings, corner Spadina road and Lowther avenue, $7,000; R. C. Bustard, 2½-sty. brick dwelling, Lowther avenue, $4,000; C. A. Jones, pr. 2-sty. brick dwellings, Fairview, $4,000; Samuel Wormersley, 2½-sty. brick dwelling, Louise street, $4,300; S. G. Near, 2-sty. brick dwelling, Major street, $4,300; J. M. Marsh, 2-sty. and attic brick dwelling, Bowden, $3,000; T. Gay and J. Dear, pr. semi-det. and 1 det. 2-sty. brick veneer dwellings, Armstrong, $6,000; B. O. Fife, 2½-sty. brick dwelling, Keele, $3,200; G. Hedderson, 2 det. 2-sty. brick dwellings, Pacific, $6,000; C. Follett, 2-sty. and attic brick dwelling, Keele street, $5,000; A. Paquette, 2-sty. brick dwelling, Foxbar road, $5,000; W. B. Charlton, pr. 2½-sty. brick dwellings, Montague, $5,500; M. M. George, alt. to apartments, Avenue road, $6,000; Mrs. H. C. Hammond, 2½-sty. brick dwelling, St. George street, $19,475; Samuel Frame, pr. 2-sty. and attic brick dwellings, Beatrice, $5,000; John Taylor & Co., 6 det. 2-sty. roughcast dwellings, Logan avenue, $4,500; J. Taylor & Co., 3 pr. 2-sty. brick veneer dwellings, Morse street, $6,000; W. G. Burns, 2-sty. and attic brick dwelling, Keele, $5,000; J. Curry, alt. to apartments, cor. Church and Charles, $6,000; S. A. Armstrong, 2-sty. and attic brick dwelling, Russell Hill Drive, $5,000; J. S. Case, 2 2½ sty. brick dwellings, Howard Park avenue, $8,000; R. T. Robinson, 2½-sty. brick dwelling, Forest Hill road, $6,000; J. Taylor & Co., 5 pr. 2-sty. brick veneer dwellings, Logan avenue, $6,000; Love Bros., Ltd., 3 2½-sty. brick dwellings, Fairview avenue, $9,000; W. P. Campbell, pr. 2-sty. R. C. dwellings, brick fronts, Withrow avenue, $3,000; J. Taylor & Co., 3 att. brick veneer dwellings, Eastern avenue, $3,900; J. A. McKenzie, pr. 2-sty. brick dwellings, St. Clarens avenue, $3,400; D. Cameron, 2½ sty. brick dwelling, Benlamond, $3,600; J. W. Brown, pr. brick dwellings, Christie, $4,000; A. Thompson, pr. brick dwellings, Uziel, $4,000; McLaren & Bird, pr. brick dwellings, $5,000; W. W. Hiltz, 2 prs. brick dwellings, Dingwall, $9,000; C. A. Grant, 5 R. C. dwellings, brick fronts, Wardell, $6,500; A. T. Mackie, 2½-sty. brick dwelling, Avenue road, $14,000; Mrs. Grafton, 2 det. 2-sty. brick dwellings, Margueretta street, $5,000; A. Smith, 3 2-sty roughcast dwellings, Emerson avenue, $4,500; Geo. Griffin, 2½-sty. brick dwelling, St. Vincent street, $3,000; C. Winyard, 2½-sty. brick dwelling and stable, Dunvegan road, $5,000; Mm. Stollery, 2½-sty. brick dwelling, Sidney, $4,000; Mitchell & Bennett, 2-sty. and attic brick dwelling, Sunnyside, $4,000.

Winnipeg, Man.

Tenders addressed to M. T. McKittrick, 552 Beresford avenue, are invited until June 26th for erection of four frame houses on Beresford avenue.

The following permits have been issued for residences and apartment blocks:—L. Albert, house on Dorchester avenue, between Wentworth and Stafford, $5,000; O. Storseter, house on Home street, $2,400; A. M. Eklund, house on Arlington, between Buell and Bath, $3,000; Wallace & Aikins, apartment building, south side of Ellice, between Spence and Young, $6,500; A. Gray, house on Central avenue, between Blanchard and Assiniboine avenue, $6,000; Horace Chevrier, house, Central avenue, between Cornish and Blanchard, $8,000; R. H. Lear, apartment block, southwest corner of Langside and Buell, $33,000. W. W. Cross, builder.

Business Buildings and Industrial Plants

Bath, N.B.

A total loss of $12,000 was sustained here last week in a fire which destroyed Tomplains Bros.' general store and Gilbertson's hotel.

Bathurst, N.B.

The Nepisiguit Lumber Company, composed principally of American capitalists, has purchased the mill and timber lands of Adams, Barns & Company and will erect modern new buildings. Address F. S. Morse Lumber Company, Springfield, Mass.

Brantford, Ont.

The Brantford Real Estate Company will erect three three-storey buildings on Dalhousie street and a two storey building on Darling street.

Calgary, Alta.

The National Drug Company are to erect a three storey warehouse at the corner of Seventh avenue and Third street west.

Fort Frances, Ont.

The construction of a large paper mill is projected. Address Warren Curtis, Jr.

Halifax, N.S.

The packing building of the Nova Scotia Furnishing Company was recently destroyed by fire.

Hamilton, Ont.

W. A. Edwards has been granted a permit for additions to the premises of the Frost Wire Fence Company, at a cost of $10,000.

Hanover, Ont.

The Williams, Greene & Rome Company, shirt manufacturers, Berlin, Ont., will probably build a $6,000 branch factory here.

Joggin Mines, N.S.

The properties of John Hennessey and Chas. Melanson, comprising stores and dwellings, were destroyed by fire last week.

Kinistino, Sask.

The Kinistino Milling & Elevator Company have secured a mill site and will at once start building operations.

Moncton, N.B.

Peter McSweeney Company, Limited, are preparing to build a large addition to their store.

Montreal, Que.

The premises of Jas. Walker & Company were damaged by fire last week at a total estimated loss of $35,000.

Moose Jaw, Sask.

The Union Bank have purchased a site for the erection of a five storey business and office block.

Nelson, B.C.

A. MacDonald, of Winnipeg, has purchased a site on Baker street for the erection of a three storey brick building for offices and warehouses. He will also erect a new warehouse alongside the C. P. R. tracks.

Newcastle. N.B.

The Royal Bank of Canada will erect a branch building here.

The Drummonds have accepted the offer of a free site from the town and will commence shortly to build docks there for shipping their ore. A branch line is to be built from the mines to the Intercolonial at Black's cut, about four miles south of Bathurst.

Ottawa, Ont.

The premises of Messrs. McLaughlin, W. Y. Soper and others were damaged by fire last week.

Six small stores and dwellings on Bank street were destroyed by fire last week. J. G. Howe, C. Bink, D. Goulet and C. Miller are interested.

The stabling of J. Plankett on Division street and seven houses on Lebreton and Louisa streets were destroyed by fire last week at a total loss of $20,000.

Port Arthur, Ont.

The Dixon Bridge Works Company are looking for a suitable place in the west for the location of a branch of their business. They are said to favor Port Arthur.

Rapid City, Man.

W. J. Lindsay, W. Highet and E. J. Short, of Brandon, Man., contemplate extensive improvements to their grist mill here. They propose to establish an oatmeal mill and general elevator business and may build a spur from the railway.

Regina, Alta.

Cook & Vanstone will proceed at once with the erection of a 100 barrel flour mill.

St. Boniface, Man.

The Manitoba Rolling Mills Company will remove their plant from Winnipeg to St. Boniface. They have secured a site of thirteen acres directly across Marion street from the new stock yards.

St. Thomas, Ont.

Parker & Son, liverymen, will enlarge their premises.

Toronto, Ont.

A. O. Scott will build a two storey brick store and dwelling on Bloor street at a cost of $4,500.

G. Weston will erect a three storey brick stable and repair shop on Sullivan street at a cost of $20,000.

Thos. Logie has a permit for a pair of brick stores corner of Christie and Yarmouth. Cost $3,000.

The Metropolitan Bank has taken out a permit for a $7,000 brick building corner of Broadview and Danforth road.

Plans have been completed for a new $18,000 factory to be erected by the Imperial Extract Company, corner of Matilda and Steiner streets.

T. Ennis will build a $3,500 blacksmith shop and dwelling at 516 Bathurst street.

A permit has been issued to Alfred Butler for a pair of brick stores and dwellings corner of Euclid avenue and College street. Estimated cost $8,000.

The latest permits for business buildings include the following: Expanded Metal Company, one storey concrete and metal factory, Fraser avenue, $10,000; T. Gibson, alterations to warehouse, 76 Wellington street west, $6,500; J. Singer, four attached brick stores and dwellings, corner Givens and College, $15,000; L. Legrow, two storey brick store and dwelling, Lansdowne avenue, $5,000; Dominion Bank, alterations to bank, corner Queen and Dundas, $3,500; J. Cleal, two storey brick factory, Macdonnell aveue, $8,000; W. H. Martin, three attached three-storey brick stores and dwellings, and three two-storey brick stables, corner Queen and Hambly, $14,000.

Upham, N.B.

The lumber mill of B. W. Titus was recently destroyed by fire.

North Vancouver, B.C.

The City Council is negotiating with a concern which is desirous of establishing a boiler works in this city.

Vancouver, B.C.

Plans for extensive improvements to the Yale hotel have been filed with the building inspector. Estimated cost $20,000.

Tenders are wanted for a two storey brick block 50 x 75 on Powell street. Plans and specifications at 2931 Quebec street.

The Canada Life Association is having plans prepared for a seven storey fireproof office building to be erected on the site of the old Leland hotel.

Ex-Ald. J. Rogers will erect a 10 storey building corner of Granville and Pender streets. Construction will probably be commenced next spring.

Winnipeg, Man.

The Gas Engine & Traction Company will erect a large factory at Elmwood.

The erection of a large spice mill and warehouse is planned by G. F. and J. Galt, of this city.

A. E. Smith, of Reading, Mich., is negotiating with the city council with a view to establishing a new tanning and manufacturing plant.

The factory of the Great West Saddlery Company, valued at $75,000, was badly damaged by fire last week, the three upper storeys of the building being gutted.

Welland, Ont.

A. Griffiths will put up a modern business block on Division street.

Wiarton, Ont.

The foundry owned by G. S. Sinclair was destroyed by fire last week.

AWARDED.

Fort William, Ont.

The contract for the erection of the Ogilvie Flour Mills Company's extension has been awarded to Barnett & McQueen.

Montreal, Que.

Peden & McLaren, architects, 20 St. Alexis street, have awarded the contract for the erection of an ice house on Wellington street for Mr. E. T. Ewart to Reid, MacGregor & Reid, general contractors, 1552 St. Hubert street.

Saskatoon, Sask.

The Manitoba Bridge & Iron Works have secured the contract for the Canadian Northern Railway station, a 100 foot steel stack for the city and the Bank of Montreal new building.

St. Thomas, Ont.

Contracts for the Bell Telephone Company's new building have been awarded as follows: Masonry, brickwork and rein forced concrete floors, A. E. Ponsford, St. Thomas; carpentry, Green & Sons, St. Thomas; impervious floors, Terrano Flooring Company, Toronto; plastering, James Stewart, St. Thomas; roofing, Ingram & Davey, St. Thomas; plumbing, heating and gas piping, E. B. Dixon, St. Thomas; electric wiring, Hamilton & Scott, St. Thomas.

Power Plants, Electricity and Telephones

Alameda, Sask.

Tenders addressed to J. T. Gordon, secretary-treasurer, will be received until June 25th for building about 70 miles of telephone lines.

Toronto, Ont.

Tenders close June 30th with the Electrical Department for laying between 350,000 and 450,000 duct feet of underground conduit.

The Hydro-Electric Power Commission of Ontario will receive tenders for the construction of transformer station buildings in Niagara Falls and Dundas. (See advertisement.)

Bridgetown, N.S.

The town will install a new system of lighting. A special committee of the council is investigating.

AWARDED.

Cobalt, Ont.

The contract for the building of the electric road between Cobalt and Haileybury was awarded to the Nova Scotia Construction Company, of Sydney, C.B., at $125,000.

Vancouver, B.C.

The contract for a motor generator set and switchboard panel was awarded to the Canadian Westinghouse Company. The following tenders were received: Canadian Westinghouse Company for motor generator, $192, switchboard, $87; Canadian General Electric Company for motor generator, $202.50, switchboard, $187.50; The Electrical Construction Company, total, $402; The Northern Electric and Manufacturing Company, motor generator, $204, switchboard, $120.

The London Board of Directors of the British Columbia Electric Railway Company has voted to appropriate $2,500,000 for extensions and improvements to its system in Vancouver during the next twelve months. R. H. Sperling, general manager of the company, states that over half of the amount appropriated will be used for the construtcion of new tram lines in Vancouver. A new 10,000 h.p. water wheel and generator will be installed at the generating plant on the North Arm of the inlet at a cost of $250,000. A new dam will be erected at the mouth of Lake Coquitlam, to cost $200,000. Improvements will be made to the New Westminster interurban line between Vancouver and Central Park, which will involve an expenditure of about $200,000. The company will also equip the railway recently built by the Canadian Pacific Railway Company from New Westminster to Eburne along the North Arm of the Fraser to be operated by electricity. Several other extensions are also contemplated by the company.

Miscellaneous

Montreal, Que.

Recent building permits include: C. Dulac, 219 Gauthier street, two houses containing six dwellings, Dumont street, cost $8,000; D. Leclair, 1058 St. Urbain street, three houses containing nine dwellings, Dumont street, $8,000; Montreal Rolling Mills, Notre Dame street west, one storey warehouse, Vinet street, $3,000; Frank Vegina, 1175 City Hall avenue, house containing three dwellings, 610 Colonial avenue, $3,500; J. O. Dubois, 189 Amherst street, three houses containing six dwellings and three stores, Amherst street, $10,000; J. T. Ewart 184 Murray street, ice house, Wellington street, $2,000; Leon Dazois, 441 Sherbrooke street east, three storey residence, St. Hubert street, $12,000; Jas. Ross, 360 Peel street, alterations and additions to property, Peel street, $3,000; School Commissioners, St. Henri, 3 Place St. Henri, school, Notre Dame street west, $3,300; John A. Robertson, 6 St. Sacrament street, addition to warehouse, St. Helen street, $4,000; School Commissioners, St. Henri, 3 Place St. Henri, school, corner of St. James and St. Henri streets, $8,000.

Ottawa, Ont.

Tenders addressed to G. J. Desbarats, Acting Deputy Minister of Marine and Fisheries, will be received until June 29th for furnishing about 625 tons of steel plates and shapes required for construction of elevator dredge at Sorel. Specifications on application.

It is considered probable that in the near future Vancouver will be provided with a drydock and machine shops to cost $1,250,000. The proposal is said to be taking definite form, as negotiations are in progress in Ottawa. The syndicate which is to undertake this work is headed by Nicol P. Thompson, of Vancouver, and the site which has been selected is the Ross and Howard Irnworks, on Burrard Inlet. It is thought that the dock will be large enough to accommodate the Empress liners.

Toronto, Ont.

Tenders addressed to Joseph Oliver, Chairman, Board of Control, will be received until July 6th for the furnishing of penstocks for the high level interceptor. Plans and specifications may be seen at the office of City Engineer Rust.

(Continued from page 25)

Tenders and For Sale Department

Wanted

Capitalist Partner to engage in the manufacture of stone, imitation of the best granite. Process secret. Can be sold in any district, much lower than other stone. Apply Box 787 Contract Record, Toronto. 27

Tenders for Cement Curbing

Tenders for cement curbing in the Town of Waterloo, Ontario, will be received by the undersigned up to MONDAY, JUNE 28TH. Specifications may also be had from the undersigned.

The lowest or any tender not necessarily accepted.

FORD S. KUMPF
Town Clerk.

Waterloo, June 15, 1909. 25

TOWN OF CHAPLEAU

Province of Ontario

Tenders for Water Works

Sealed Tenders will be received by the Clerk until 8 p.m. on

MONDAY, JULY 5TH, 1909.

for the following sections of the proposed Water Works System:

Contract "A"—Pipelaying
" "B"—Pump House
" "C"—Water Tower
" "D"—Cast Iron Pipes and Specials
" "E"—Hydrants, Valves, etc.
" "G"—Steam Pump
" "H"—Two Boilers

Plans and specifications may be seen at the office of the Clerk, Chapleau, or at the office of the Chief Engineer, Toronto, on and after June 21st.

GEO. B. NICHOLSON, Esq.
Mayor,
Chapleau, Ont.

W. H. FARRELL, Esq.
Town Clerk,
Chapleau, Ont.

WILLIS CHIPMAN, C.E.
Chief Engineer,
103 Bay Street,
Toronto, Ont. 25

Town of Walkerville

Tenders for

Pavements and Sidewalks

Sealed tenders will be received by registered post, addressed to the undersigned up to noon on MONDAY, THE 28TH DAY OF JUNE, 1909, for the construction of Pavements and Sidewalk on the following streets in the Town of Walkerville:

Concrete pavement and concrete curb on Brant Street, from Victoria Road to Kildare Road.

Concrete pavement and curb on Windemere Road from Assumption Street to Niagara Street.

Concrete pavement and curb on Victoria Road from Wyandotte Street, running 410 feet south of Niagara Street.

A concrete sidewalk on the west side of Victoria Road from Niagara Street south to Huron Street.

Plans and specifications may be seen on application to Mr. Owen McKay, C.E., Walkerville.

Tenders must be accompanied by a marked cheque, made payable to the Town Treasurer, equal to 5 per cent. of the amount thereof

Should any party whose tender is accepted fail to execute the necessary contract and bond for the due fulfilment of the same, his deposit will be forfeited to the town.

Deposits of unsuccessful tenderers will be returned.

The lowest tender not necessarily accepted

The names of two responsible persons willing to act as sureties must accompany each tender.

CECIL H. ROBINSON,
Town Clerk,
Walkerville.

Walkerville, Ont., 9th June 1909. 25

Tenders

will be received by the City of Toronto, Canada, up till noon of JUNE 30TH, 1909, for laying between 350,000 and 450,000 duct feet of underground conduit.

For specifications, form of tender, etc., apply Electrical Department, City Hall. 25

Notice to Architects

The counties of Carleton, Lanark and Renfrew desire to receive competitive plans for a Tuberculosis Sanatorium, said plans to be in the hands of the undersigned on or before JULY 18TH, 1909.

For particulars apply to

REV. DR. MOORE,
102 Bank St., Ottawa,
Secretary. 25

To Contractors

Tenders will be received until the 28TH INST. for the work of all trades in connection with large extensions and alterations to

Victoria Hall, Queen Street East

Plans and specifications can be seen and other information obtained at my office, 164 Bay Street, Toronto.

E. J. LENNOX,
Architect.
25

Hydro-Electric Power Commission of Ontario

Tenders for Niagara Falls and Dundas Transformer Station Buildings

Tenders will be received up to 5.00 p.m., TUESDAY, JULY 6, 1909, for the construction of:

1. Transformer station building at Niagara Falls, Ontario.
   Transformer and interswitching station building at Dundas, Ontario.

All according to plans and specifications to be obtained at the offices of the Commission, Continental Life Building, Toronto, Ontario. Complete plans and specifications may be obtained upon a deposit of $5.00 for each station, which deposit will be promptly refunded upon receipt of tender, or the returns of plans and specifications.

Certified cheques to the amounts called for in the "Instructions to Bidders" must accompany each tender.

The lowest or any tender not necessarily accepted.

Tenders must be sealed and addressed to Hon. Adam Beck, Chairman, Hydro Electric Power Commission, Continental Life Building, Toronto, Ontario.

Papers inserting this advertisement without authority will not be paid for same. 25

City of Fernie, B. C.

Tender for Waterworks

Sealed tenders addressed to the City Clerk of the City of Fernie, will be received up to 5 p.m. JULY 2ND, 1909, for the installation of 14,000 feet of 12 inch Wood Pipe, an Intake Dam and a Bridge across the Elk River.

Alternate bids will be received for

(a) Furnishing material and labor
(b) " " only
(c) " labor "

The lowest or any tender not necessarily accepted.

Plans and specifications may be seen at the City Engineers' office.

R. POTTER, B. Sc.
City Engineer.

G. N. BOULTER,
City Clerk.

25

TENDERS

Regina Collegiate Institute

Tenders will be received by the undersigned, up to noon, SATURDAY, JULY 3RD, 1909 for the following:

1. Laboratory Fixtures
2. Class Room Desks
3. Assembly Room Chairs
4. Slate Blackboards
5. Dark Blinds

Plans and specifications may be obtained from Messrs. Storey & VanEgmond, Architects.

No tender necessarily accepted,

GEO. S. GAMBLE,
Sec'y-Treas. Collegiate Institute,
Regina, Sask.
25

Board of Education

For the City of Toronto

Tenders Wanted

Sealed tenders addressed to the Secretary-Treasurer will be received until

Monday Noon, June 28, 1909

for

New School Building, Boys' Home.

New School Building, on the Island.

Iron Stairs for Sundry Schools.

Midsummer Repairs (all trades.)

Plans and specifications may be seen, and all information obtained at the offices of the Board, City Hall. Each tender must be accompanied by the deposit mentioned in the said specifications and forms of tender. The lowest or any tender will not necessarily be accepted.

WM. HOUSTON,
Chairman of Committee

W. C. WILKINSON,
Secretary-Treasurer.

25

Town of North Battleford

Province of Saskatchewan

TENDERS WANTED

Sealed tenders addressed to the undersigned Secretary-Treasurer, and marked "Tenders," will be received until 8 p.m., on FRIDAY, JULY 2nd, 1909, for

(A) Excavating and pipelaying.
(B) Erection of pump house and power house.
(C) 1 Furnishing and erecting steel stand pipe.
  2. Concrete foundation for stand pipe.
  3. Housing for stand pipe.
(D) Furnishing cast iron water pipes and special castings.
(E) Furnishing fire hydrants, gate valves and valve boxes.
(G) Furnishing and erecting pumping machinery.
(H) Furnishing and erecting boilers.
(J) Furnishing and erecting steam engine.
(K) Furnishing and erecting electrical equipment.

Plans and specifications will not be sent out but may be seen at the offices of the Chief Engineer, 103 Bay Street, Toronto; Room 47, Canada Life Building, Winnipeg; or at the office of the Secretary-Treasurer, North Battleford.

The lowest or any tender not necessarily accepted.

J. A. GREGORY, Mayor.
S COOKSON, Secretary-Treasurer.
WILLIS CHIPMAN, Chief Engineer.

25

To Contractors

Sealed tenders, endorsed "Tenders for Concrete Foundation Work," addressed to the undersigned, will be received at this department until noon on MONDAY, THE 5th JULY, 1909, for the Concrete Foundation Work required in connection with the extensions to the Ontario Government Buildings, Queen's Park. Plans and specifications may be seen at the offices of Geo. W. Gouinlock, Architect, 1108 Temple Building, Toronto.

An accepted cheque, payable to the order of Honourable J. O. Reaume, Minister of Public Works, for five per cent. of the amount of the tender, and the bona-fide signatures and addresses of two sureties, or the name of a guarantee company, approved of by this department, must accompany each tender.

The department will not be bound to accept the lowest or any tender.

By order,
H. F. McNAUGHTEN,
Secretary Public Works.

Department of Public Works, Ontario,
Toronto, 21st June, 1909.

(Newspapers publishing this advertisement without will not be paid for it.) 25

Positions Wanted or Vacant

GRANITE LETTERER—Also granite base-cutter. Box 792 CONTRACT RECORD, Toronto. 25

Miscellaneous

REPRESENTATIVES WANTED—A United States firm manufacturing Steam Rollers, Road Locomotives and Road Making Machinery want Canadian representatives in Toronto, Montreal Vancouver Winnipeg and other large cities. This is a splendid chance to get hold of a desirable and good-selling line. Box 784 CONTRACT RECORD, Toronto. 27

Business Chance

A United States Firm manufacturing Composition Capitals, Interior Plastic Relief, Composition Ornaments, etc., are open to appoint Canadian agents in Toronto, Montreal and other large cities. A liberal arrangement will be made with a desirable firm. Box 785 CONTRACT RECORD, Toronto. 27

Tenders for Removal of Houses

Tenders for the purchase and removal of the houses and out buildings on the site of the New St. Michael's Hospital will be received by the undersigned till noon of FRIDAY JULY 2nd, 1909.

Specifications and all information can be obtained at my office 15 Toronto Street, Toronto.

No tender necessarily accepted

A. A. POST,
Architect.

25

Tenders Wanted

Sealed tenders, addressed to the undersigned, will be received until 4 o'clock p.m. of MONDAY, JULY 12th, 1909, for the erection and completion of a

Steel Bridge and Concrete Abutments

for the same in the Township of East Zorra, Oxford County.

Length of bridge, 30 ft. Width, 14 ft. Height of abutments, probably 12 ft.

Tenders to be for either beam or truss span and capable of carrying a cement floor and 20,000 lbs. load. Work to be completed on or before October 1st.

JAMES ANDERSON,
Clerk East Zorra.
Hickson, P. O., Ont.

26

Miscellaneous

(Continued from page 23)

Winnipeg, Man.

Tenders are wanted on the supply and erection of approximately twenty miles of wire fencing. These contracts are in connection with the hydro-electric power development. Bids close July 2nd. Address M. Peterson, Secretary, Board of Control.

AWARDED.

Cobalt, Ont.

The Kerr Engine Company, Limited, of Walkerville, Ont., will supply the iron body gate valves for the Cobalt Hydraulic Power Company, Limited, of Cobalt, Ont.

Gravenhurst, Ont.

Debentures amounting to $20,000, issued for waterworks purposes have been awarded to G. A. Stimson & Company, Toronto.

Medicine Hat, Alta.

J. O. Grant has the contract to sink a 2,000 foot gas well for the city at $7.50 a foot.

Ottawa, Ont.

A contract for dredging in Port Arthur at the fish dock and the Thunder Bay dock has been awarded to W. E. Phin, of Port Arthur. The amount is about $50,000.

Vancouver, B.C.

The tender of the Canadian Westinghouse Company has been accepted for supply to city of copper wire.

The city council have accepted the tender of Æmilius Jarvis & Company for $1,397,000 4 per cent. 40-year bonds. The loan is for various purposes, including street improvements, sewers, park improvements, school extension, incinerator plant, hospital, etc.

Victoria, B.C.

Contracts for fire apparatus and material have been awarded as follows: Hose: Vancouver Rubber Company, 1,000 feet of Paragon brand, at $1 per foot; Canada Rubber Company, 1,000 feet of Squelcher brand, 95 cents per foot; J. L. Beckwith, 1,000 feet of Dunlop, double-jacket hose, at $1 per foot. Chemical hose: Vancouver Rubber Company, 600 feet of Maseset brand, at 69 cents per foot. Two combination chemicals, W. E. Seagrave Company, $5,300; one city service hook and ladder truck, W. E. Seagrave Company, $2,900; one hose wagon, T. H. Brayshaw, $475.

New Companies

The New Empire Wall Paper Company, Limited, Toronto, Ont., incorporated, capital $50,000. Incorporators, A. T. Struthers, G. E. McCann, W. H. Syms and others, all of Toronto.

Fingal Telephone Company, Limited, Fingal, Ont., incorporated, capital, $5,000. Incorporators, J. Steele, J. S. Turner, H. J. Henderson, A. M. Blake, R. W. Waters and D. J. Scott, all of the Township of Southwold, Ont.

Sault Ste. Marie Dry Dock and Shipbuilding Company, Limited, Sault Ste. Marie, incorporated, capital, $1,000,000. Incorporators, John O'Boyle, W. H. Plummer, W. O'Brien, W. H. Hearst and J. McKay, all of Sault Ste. Marie, Ont.

General Construction and Dredging Company, Limited, Toronto, incorporated, capital $300,000. Incorporators, D. R. Leask, W. J. Tubman, W. R. Wadsworth and others, all of Toronto.

Harris Construction Company, Limited, Montreal, Que., incorporated, capital, $50,000. Incorporators, F. H. Markey, J. C. Hickson, W. C. Pugsley and others, all of Montreal.

Business Notes

Watts & Brunskill, railroad contractors, Winnipeg, Man., have dissolved partnership.

The Sturgeon Lake Lumber Company, Limited, have sold their business to the Beaver Lumber Company, Limited.

Mr. J. W. Ross has been appointed liquidator in the affairs of the Ross & Harris Company, Limited, contractors, Montreal, Que.

Lebel & Forgues, contractors, Montreal, Que., have dissolved partnership; also Valin, Antoine & Company, contractors, same city.

E. O. Lyte, Vancouver, manufacturer of sash and doors, has secured incorporation under the firm name of the B. C. Sash & Door Company, Limited.

The Edmonton Iron Works, of Edmonton, Alta., are building a new and much enlaredl plant, 200 x 66 feet. The company found it necessary to do this in order to take care of the structural steel work which they had to do. The new building will be entirely fireproof and of steel construction. The Edmonton Iron Works, when this new plant is completed, will have one of the largest and best plants in the one of the best plants of this kind in the West, outside of Winnipeg. They are general machinists, iron and brass founders, and also do boiler work and will make a specialty of structural steel work.

At the Russell House, Ottawa, on June 23rd, the pine timber on the Dokis Indian Reserve, on the French River, comprising an area of six and a half miles, will be sold by auction. Further particulars may be obtained from J. D. McLean, Secretary, Department of Indian Affairs, Ottawa.

The production of Portland cement in the United States during 1908 shows a large increase over the previous year, 51,002,612 barrels, comparing with 48,785,390 barrels. In value, however, there was a decline of nearly 20 per cent., $43,472,679 in 1908, comparing with $53,992,554.

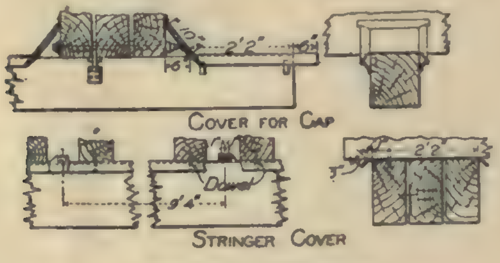
The Protection of Members on Wooden Bridges

Deterioration due to Exposure to Weather prevented by Use of Galvanized Iron Covers

How the deterioration of members in wooden bridge structures, due to exposure to the weather, has been overcome on an American railroad by the use of galvanized iron covers, is described by a writer in the "Engineering Record," who says:

Protection against fire caused by locomotive sparks or by other sources also is obtained incidentally in this manner. The galvanized iron in all cases is of No. 22 gauge as purchased in the open market.

The arrangement of the covers for the caps of bents carrying a set of three stringers under each rail is shown in the accompanying drawing. The portion of the cap between the two sets of stringers is covered by one sheet, 18 inches wide by 7.5 feet long; the ends outside of the stringers are covered by a sheet of the same width and 5.5 feet in length, which is cut transversely in halves. These sheets are bent up at the ends and nailed to the sides of the stringers. Both sides of each sheet also are bent down and riveted to 1-inch strips, nailed to the cap. Where double caps are used, the sheets of galvanized iron are made 24 inches wide, and are fastened in the same manner. This is done to shelter the joint between the caps. In case each rail is carried by only two stringers the length of the sheet covering the ends of the caps is increased to 7 feet.



Protection of Members.

The stringers are covered with galvanized iron in strips 9 feet 10 inches long and 24 or 35 inches wide, depending on whether two or three stringers are placed under each rail. This length is adopted in order to bring the lap joint always between two ties, the latter being spaced 16 inches apart on centres. On both sides of the set of stringers, 1 inch from the edge of the outer one of the set, the cover is bent down at a 45-degree angle to form an overhang that deflects the water from the timber on which it is placed. The ties are anchored to the stringers by $\frac{3}{4}$-inch iron dowels, 5 inches long, two of these dowels being placed to each tie, and alternating on inside and outside members of the chord. The dowels are driven $2\frac{1}{2}$ inches into the stringers in holes bored with an 11-16-inch bit to insure a driving fit.

The deck of the structure is framed in place with the galvanized iron covers omitted. The ties and guard-rails are then jacked up to allow the sheets of galvanized iron to be slipped over the dowels. When they are dropped back into place their weight is sufficient to cause the dowels to puncture the galvanized iron, thus securely anchoring the covers. At the junction between the cover strips is an interlocking joint formed by bending the iron, as shown in the accompanying drawing.

Imperfect framing, such as is unavoidable, occasionally has caused the covers on the stringers to creep outwardly. Slots thus torn at the dowels allow considerable water to find its way to the stringers. Experiments to prevent this creeping are still in progress. The method that has been most successful is to place around the dowels cut washers with an outer diameter of 2 inches. Holes, $2\frac{1}{4}$ inches in diameter, are countersunk to a depth of $\frac{1}{4}$ to $\frac{3}{8}$ inch in the bottoms of the ties. When these ties and guard-rails have been jacked up so the covers can be placed, the washers are placed around the dowels and the ties and guardrails then lowered in the usual manner. The countersunk holes in the ties allow the galvanized iron cover to assume a conical shape at each of the dowels, when the latter are pushed home. This shaping is accentuated by the washers on the stringers. The conical surface prevents leakage, and water will flow off the chord before mounting this surface. It has been found necessary to countersink somewhat deeper than the thickness of the washers, however, to prevent capillarity from drawing water through the hole in the iron. Creeping also has been stopped by crimping the iron tightly against the side of the inner stringer and fastening it in place with tinners' nails, driven about 1 inch down from the top. Below the nails the iron is flared away from the stringer again to obtain the usual protection against drip.

Covers of this kind were employed first on this railway in 1899. The satisfactory results obtained previously by the use of such covers on other roads had much to do with their adoption. On this earlier work no attempt was made to prevent the galvanized iron from creeping or to keep it in repair. Notwithstanding this lack of attention, the covering brought about a life of about 20 years in pine stringers. Caps that had been covered previously, in 1887, also are still sound. These facts led to the general adoption of such covers by the latter company.

The covers are now placed on all new trestles and on existing structures when the stringers are moved or replaced. The life of timbers thus protected from being alternately wet and dry has been found without exception to be increased greatly. In fact, in most cases where the covers have been used, the timbers still remain in good condition. The covers also have been employed to some extent with equally satisfactory results to protect the floor beams and stringers of steel structures.

Have Opened Toronto Offices

One of the most modern plants in structural iron, brass, bronze, and ornamental iron work of every description is that of the Dennis Wire & Iron Works Company, Limited, of London, Canada. They have recently enlarged their plant and the engineering staff has been increased. Branch offices have been established at 103 Pacific Building, 23 Scott street, Toronto, to look after their business in that district, under the management of Mr. C. R. Eberhard, C.E., who, for a number of years past, has been in charge of important work in New York City and vicinity, embracing structural steel and ornamental iron.

ESTABLISHED 1886

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The Situation and Outlook

This is what might be termed the "Midsummer Issue" of the "Contract Record," and it is an opportune number in which to take stock of the building situation. Generally speaking, throughout the length and breadth of Canada, construction interests have realized during the last few months a complete revival of activity. Perhaps there have been the greatest advances in house building, but after all, there is little to chose. Industrial structures of all kinds, particularly factories and warehouses, are going up in goodly numbers, as a glance at our Contracts Department will show, and there seems to be just the desired, proportionate progress all along the line.

It is noteworthy that the character of construction this season is of a high average, and the buildings which are going up, in both the cities and the smaller communities, are less inclined to be of the cheap order. This is in part, a natural result, for it is noticeable that the better buildings, those which cost the most and command the highest rent, are the structures which do not lack tenants, while the cheaper structures are more inclined to command a cheaper class of tenants and to be associated with more frequent changes.

A feature of the season which must be very satisfactory to builders is its immunity from labor troubles. There have been several little storms in various quarters and the horizon has at times been clouded, but the storms have been succeeded by the inevitable calm and the outlook at present could hardly be brighter. A short time ago the Toronto carpenters were talking about increased wages, but they did wisely to reconsider the matter. Similar advances were discussed in various branches of the building trade at Winnipeg,, Edmonton and other points, but the disturbing elements were happily not strong enough to cause a break.

Another satisfactory circumstance, right along to date, is the weather. The trade has been particularly fortunate in this regard for the past year. Then again, there have been neither revolutions in the price lists nor handicaps as to the reasonable delivery of materials, and this in spite of the prevailing rush of business. Altogether, conditions are most satisfactory. Whether contractors realize this as much as they should is an open question. There are indications that there has been a keener competition for business and a closer trimming of prices than has been justified by the situation. At any rate, present conditions are all in favor of the contractor, and if he is not well ahead at the end of the present season he will have nobody to blame but himself.

Estimating in Rush Times

In rush times there has always been a tendency on the part of the contractor to take rather more than a proper share of risk in estimating. Architects frequently receive offers over the telephone to submit bids within a few hours. The man who makes such an offer is risking his money at too fast a pace. The contractor should be particularly careful in the busy season to steer clear of unsystematic, hurried bidding. Of course, there is no stated proportion of time in estimating. A contractor may spend three or four days in figuring a small piece of work and then only require a few hours' time to estimate a large job, but he should not tell an architect over the telephone that he can estimate a job in two hours until he has seen the plans.

In making up an estimate it is better to keep each factor of a complete estimate separate as much as possible, to finish it and double line it, and to make a summary at the end of all the different items or classes of work, so that in case any change in specifications is made in any one class of work the whole will not have to be added and corrected from page to page. The same system should be carried out with subheadings. For example, in brick work there may be many different items. If the whole is put down as so many cubic feet or thousand brick, there is no way of separating a change without going over the whole job again.

The specifications should be followed as nearly as possible, item by item, starting with excavating or whatever may come first. Each branch of work should be kept separate. Extensions should be carried out to the cents and the profit added at the last, in one item, unless the bid is made up on each branch of work separately, in which case it is advisable to add the profits to each branch.

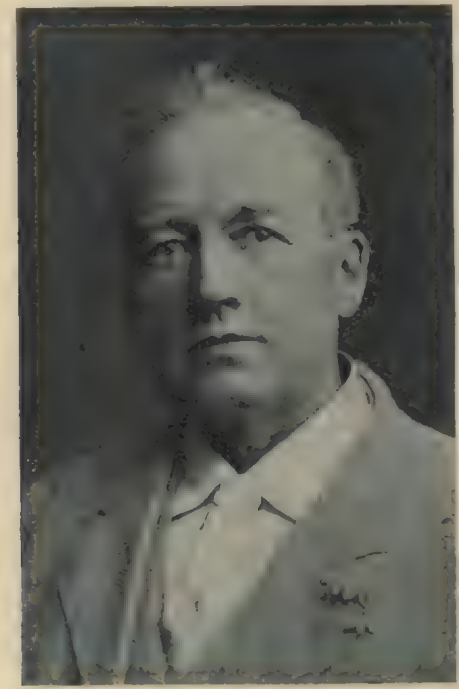
A tender should always be itemized, as all excavating, brick work, cut stone, carpentry, plumbing, etc., thereby eliminating any hidden work that may not show on the plans or may not be mentioned in the specifications.

Leading Canadian Contractors

M. A. Pigott, Hamilton, Ont.

In no line of industrial activity can the city of Hamilton, Ont., boast of more progressive citizens than in the contracting business. Mr. M. A. Pigott, of Hamilton, Ont., the subject of this sketch, is one of the best known general contractors in the eastern field to-day.

Michael A. Pigott was born in Trafalgar township, Halton county, on June 14th, 1850, and was of Irish parentage. His father came originally from Dublin, Ireland, and emigrated to Canada in 1836, settling after a time on a farm in Halton county, where Michael A. was born. Subsequently the elder Pigott removed to a farm near Guelph, Ont. The son first attended the district schools in the "Scotch Block" until he was twelve years old, after which he attended school in Guelph. Until he was twenty-one he remained with his father on the farm and learned the trade of a carpenter. In 1871, he removed to Toronto and worked at his trade, at the same time improving himself by acquiring a knowledge of draughting and architectural work. Five years later he returned to Guelph and began as a contractor in a small way.



Michael A. Pigott, of Hamilton, Ont.

Business having prospered with him, in 1879 Mr. Pigott removed to Hamilton, where he engaged in general contracting work. In 1883 he secured a contract for several business blocks, and one in connection with the erection of St. Mary's Cathedral at Hamilton. The following year he built several of the most important wholesale blocks in Hamilton. In 1895 he obtained contracts for the post office at Galt, Ont., and similar public buildings at Orangeville, Ont. In 1886 he built the drill hall and armory at Hamilton. During 1887 and 1888 he erected the handsome City Hall of the city of Hamilton.

For the next two years Mr. Pigott devoted himself to the erection of business blocks of which he himself remained the owner. In 1891 he built the Convent of the Sisters of the Precious Blood, at Toronto, and in 1892-3 had a contract on hand for the Ontario Government, erecting part of the buildings at Brockville Asylum. Following these contracts was one for the well known monastery of the Carmelite Community at Falls View, near Niagara Falls, Ontario.

In 1896 Mr. Pigott went into railroad contracting, and constructed the spur line of the C.P.R. from the Hamilton tunnel to the Desjardins canal, where the line joins the Grand Trunk Railway. The work was completed precisely in six months. In 1897-8 Messrs. Pigott & Ingles built sections A and B of the Granville locks for the Federal Department of Railways and Canals. In 1899 Mr. Pigott constructed the water-power works at Port Dalhousie, Ont. After the completion of this work the activities of Mr. Pigott for the next two years were chiefly centred at Meaford, Ont., where he constructed the harbor works, including breakwater and docks, at the same time carrying on the necessary work of dredging. He also built several miles of road for the G.T.R., connecting their line with the new docks. In 1902 he was associated with the late John W. Munro, M.P.P., of Pembroke, Ont., in the work of power development and mill construction on the Spanish river for the Spanish River Pulp & Paper Company, Limited.

A contract which brought considerable commendation to Mr. Pigott was that for the erection of the Deering Harvester Works, which was executed in the latter part of 1903 and beginning of 1904. This contract was what might be termed an emergency one, and Mr. Pigott proved himself to be the right man for the occasion. The entire contract was carried out by him in record time and evoked the most enthusiastic praise from those interested. In a special article devoted to this particular work, published by the Toronto "Globe" on March 5th, 1904, it was pointed out that if the several structures in these works were joined together they would extend over a distance of more than half a mile in length. Many of the buildings were five storeys in height.

In the fall of 1904, Mr. Pigott was awarded an important contract for the Guelph & Goderich Railway. This work was of a very heavy nature and cost more than one and a quarter million dollars. A feature in connection with this contract was that by August, 1907, trains were running over the entire road, while for half the year previous to that date the railway company were able to carry on their business on the eastern half of the line.

Mr. Pigott's success as a contractor has justified the confidence placed in him many years ago by his best friends. The varied nature of his experience has given him a thorough mastery of his business and has fitted him to tackle confidently almost any kind of contract. During the period of more than thirty years that Mr. Pigott has been contracting, he has never undertaken a contract which he has failed to finish, and considering the number and magnitude of the various jobs that he has carried out this is saying a great deal. He has never compromised or made any assignment during his business career, and, as he once told us, he has "always paid one hundred cents on the dollar." It is not luck which has brought to Mr. Pigott the measure of success that he has attained. Primarily, we venture to think, it is his innate perceptivity, his progressiveness and his faculty of taking opportunities as they are offered.

The building permits issued at Moose Jaw, Sask., for the first five months of the year were two-thirds larger than those for the corresponding period of last year. Up to the end of May, the total was $252,400, against $151,700 last year.

Suggested Reforms in Methods of Contracting

The Pros and Cons of the Present System outlined by Frank Miles Day, A. I. A.

In a recent talk before the Master Builders' Association of Philadelphia, Mr. Frank Miles Day, former president of the American Institute of Architects, made the following interesting suggestions touching reforms in the methods of contracting:

"It is told how Brunelleschi designed scaffolding used by the workmen; that he invented necessary machinery; examined clay and bricks, and watched the stone; that he made models of clay and wax—and even of turnips. He made a scale model of wood, hiring a joiner to assist him, and, as the story goes, was allowed about ten dollars, in our money, for the model.

"And about this time occurred, not the first, perhaps, but one of the first 'strikes' of working men. The masons, who had been building the Douma said: 'See we are the only ones who know.' Their wages had been doubled and yet they wanted more, and Brunelleschi refused it them; whereupon the 'struck'—laid down their tools and refused to work. Next morning Brunelleschi had ten Lombardi there and he showed them how to set the stone; supervised the work until they became proficient. And then the 'strikers' came back; saw what had been done and offered to return to work. They came back again and went to work at the wages first offered them. This occurred over five hundred years ago. It shows the intimacy which existed between the designer and the workmen—the architect and those who executed his work.

"This relationship is changed under our present system of building. The modern system sees a divorce between the architect and the master builder. The architect of to-day puts down his ideas on paper and has merely to see that his designs are carried out, yet he is not the executive builder.

"The general contracting system is with us. It has its advantages and its defects and they concern architects and builders. My opinion is that throughout the country something is wrong with the general contracting system. Let us look at the advantages of the system: To the man who builds it brings fair compensation; the owner knows what it will cost him to build. The architect, as his 'watch dog,' sees that the work is done and done right. Now, this general contracting system is well grounded in America. We have the evils of the system enforced upon us. If all general contractors were men of property, skill and probity, all would be well and good. But we have all kinds of general contractors. A reliable, reputable contractor has to bid against an irresponsible and perhaps, unscrupulous contractor. Another defect of the system is that the owner has to entrust work to a man whose interests are not those of the owner. The owner is apt to set up a man who has his own and not the owner's interests at heart. This man may have no organization of skilled workers; no executive ability; and the work is done by sub-contractors.

"I have six plans to offer in correction of the evils of the present day general contracting system. First, choose general contractors of honor, high integrity and well equipped by education and experience to carry on building work. The owner should select such a contractor, but he goes by bids. We should insist that we get the best contractor we can. Second, we should seek to control the men who actually do the work, and we can do this—or attempt to do it, by getting a list of the men who get the sub-contract. The general contractor should furnish a list of names of those he expects will do the work. And yet, the owner doesn't care so much as to who does the casual work—and he will not pay more if different sub-contractors are preferred. Third, architects should name in advance to general contractors—to bidders—the sub-contractors he wants to do the work. But this remedy meets with objection at once. Bidders 'kick' against it; and will not have it. Fourth, architects should receive bids in advance and then they could allow an allotted sum for each kind of work. This scheme, however, can hardly be put into practical execution. I know a Boston man who had an experience in erecting a bank edifice. He told the bidders they must put $300,000 in stone—and they objected to being dictated to. Fifth, the master builder should be put upon a quasi-professional basis. This is a better scheme than some I have suggested, because it enables the owner and architect to select the right kind of a man. Under this plan the builder would do his work honestly and well, for, being a professional man, and one of probity, reputation and standing, he would be sure to earn a fair competency and would be sure to do good work. This might be termed an 'on honor' basis and it seems to me to be the best solution of the matter. Builders employed on a 'fixed charge' or commission basis are quite sure to do good work and there is nothing antagonistic between owner and builder. Sixth, place the architect in the position of master builder—virtually the reverse of the fifth plan suggested to remedy the evils of the present general contracting system. For the architect to be master builder means that he will have the direct letting of the different parts of the work to workmen. This enables mechanics to feel that they are on a direct basis. Mechanics can bid against their own class. And yet I would be sorry to see this system introduced if architects of indiscriminate ability and knowledge were to be allowed to be master builders. The plan to have architects master builders, to be successful, takes into account the fact that such architects should have a good system and organization back of them as well as ability, knowledge and executive capacity. The danger may be, too, that if the architect became too much interested in the details of construction, he would lose sight of designing. It would, at any rate, be a bad system for general contractors as we now have them, for, under it, they would not exist.

"Another plan has been suggested—and virtually 'indicted' by Chicago architects, viz.: When the drawings and plans are ready let us have a quantitative surveyor to take off the plans; he can say to the owner: 'Your building will cost so much; shall I go ahead? If not, we can make changes.' The quantitative surveyor can say to mechanics: 'Here is a contract that will bring you in so much. Do you want it?' Brassey, the English architect, used this plan more or less—and it is a good one where honorable men are involved and not so good where the contrary is the case and 'skimping' may be done.

"This striving to get away from 'open bidding' is a result of a departure from old time methods. The present system is unfortunate to the owner because he is not in touch with the actual builders, and this is because he deals with the general contractor. There are two main courses as to the future: The elimination of the broker contractor (who does no actual work, and the making of the architect into a master builder. The second course is one which will put the builder on a different plane from that he now occupies, viz.: A professional plane. A plane on a level with that of doctors, lawyers and other professional men. The builder must be experienced, skilful and educated. He should not be left to chance in order to make a profit. Under the system of a 'fixed charge' he would be sure to be remunerated. He would have the responsibility of the work on his shoulders; would aid and help architect and owner and see that their wishes were carried out."

Obituary

Alex. White, architect, a resident of Woodstock, Ont., died suddenly on June 9th.

Chevalier John Heney, a pioneer contractor of Ottawa, Ont., passed away last week at the advanced age of 88 years.

Geo. O. Williams, contractor, Toronto, Ont., died last week of typhoid fever. Mr. Williams was in his forty-fifth year.

John J. Maunder, well known in Ottawa and Toronto contracting circles, passed away in the Federal capital after a short illness of pneumonia. Deceased was 58 years old.

Thos. Ritchie, a prominent contractor of Halifax, N.S., died of heart disease last week. He was president of the Eastern Trust Company, and a director of the Royal Bank of Canada, Starr Manufacturing Company, Acadia Fire Insurance Company and Nova Scotia Paving, Building & Loan Society Mr. Ritchie was sixty-seven years of age.

Personals

Mr. Frank Chappell has been appointed town engineer and superintendent of waterworks by the town of Oshawa, Ont.

Sir Robert Perks, the well known contractor, is on his way to England. It is understood that the Government has declined to guarantee the bonds of his company for the construction of the Georgian Bay Canal.

Mr. A. G. Fawcett-Valentine, C.E., has been appointed assistant superintendent of waterworks for the city of Peterboro, Ont. Mr. Valentine graduated as a civil engineer in England, and was assistant engineer and surveyor to a municipality there, under Chief Engineer Gale, A.M.I.C.E., before coming to Canada.

The Copp, Clark Company, Limited, have favored us with a copy of "Chemistry and Physics of Building Materials," by Alan E. Munby, M.A. (Cantab). Fellow of the Chemical Society, etc. The work is a review of the chemical and physical principles underlying the use of building materials. In the first part of the book a general study of the sciences applicable to the production, use and decay of materials is taken up, while in the second part of the volume these principles are applied to the study of stones, brick, clays, limes and cements, the metals, timber and paints. The book comprises 345 pages, and is published in London by Archibald Constable & Company, Limited, and in Canada by the Copp, Clark Company, Limited, Toronto. Price, $1.80.

Competition for Architectural Students

The Last Week for the Preparation of Plans

Architectural students are reminded of the competition inaugurated by this journal for designs for a $2,500 suburban or town residence. The drawings are to be sent to the Editor **not later than June 30th,** and are to be signed by a "nom de plume" and accompanied by an envelope containing the student's name, address and nom-de-plume, on one sheet of paper. For the benefit of any who may not have seen the original announcement, the details are appended:

The competition will be open to all Canadian students in architecture.

Three prizes of $20, $15 and $10 will be given.

The following members of the Ontario Association of Architects will act as judges: Messrs. H. B. Gordon, of Gordon & Helliwell, Toronto; James Gemmell, of Smith & Gemmell, Toronto, and H. Sproatt, of Sproatt & Rolph, Toronto.

Designs are to be for a suburban, town or small city residence, to cost $2,500, on a permanent foundation, the lot to be 50 x 150 feet. A house with an extended front will be preferred rather than a deep one. The building is to be kept back from the roadway 50 feet, and path, grass or garden are to be shown in front and vegetable garden, shrubs or fruit trees plotted out.

The accommodation is to be as follows:

First floor:—

Living room	12 x 18 square feet.
Study	8 x 12 square feet.
Kitchen	12 x 10 square feet.

Entrance hall, stairs, vestibule and coat room, pantry and verandah.

Second floor:—

Bathroom and three bedrooms.

The materials of construction are to be concrete for the cellar, and wood boarded frame, finished with shingles, clapboard or plaster.

The designs are to be drawn to scale of ⅛-inch and to include three plans and two elevations, also perspective if desired, but not obligatory.

Drawings are to be in black ink only, on white paper—walls blacked in. Elevations may be shaded in brush or pen work.

The decision of the judges will be published as soon as possible after the close of the competition.

The drawings are to be the property of the "Contract Record," which is to be at liberty to reproduce those which it desires to publish.

The Construction of Small-Sized Concrete Arches

General Directions on the Proper Methods to Employ in the Building of Forms for a 4-foot Arch

As the small-sized concrete arches cost more per square yard to construct and are more numerous than larger ones, we are presenting here a standard 4-foot arch. Figs. 1 and 2 show a square head wall, built in sections that can be used a number of times. The end should be made full height, and when done, should be ripped at the bottom from about two inches at the centre to about four inches at the sides, as the footing is often too high and trouble results. When it is set in place put a block under the centre that will bring it up to the proper height, and when the front side is plumb put a block under each corner. You will find this better, as the blocks can be knocked down when the form is taken down, giving the clearance under the coping, and as the filling covers the bottom, it requires no further attention. See A in fig. 1. When both ends are set up put the face of head wall in place and put the bolts in, as shown in B in fig. 2. The board that forms the back of the coping should now be put on to hold the form in place. The whole can now be shifted into position. As the opening C C in fig. 2 permits the centre line to be drawn from one end to the other, hang the plumb bob at D in fig. 2, taking the centre line of track measure out the required distance. As the back of the head wall is open the arch ring or core should now be put in. Begin by putting down the sills, which are made of two pieces of 2 by 8 nailed together as shown at E in fig. 2, and levelling with a wedge. Next put frames F in place and board up. Semi-circles can now be put in place and lagging put on. Sections G and H in fig. 1 can now be placed, forming the back of the head wall and the whaling timbers, ii in fig. 1, put on and tightened up with bolts. Then the back of bench wall is put in place and a small V strip tacked up the front corners and around the arch ring and against the head wall. The coping can be straightened and strips nailed across the studding as shown at J in fig. 1. The form is now ready for concrete. Fig. 3 shows the plan with 30 degree wings, which can also be put in sections, but as they are easily knocked out of true it would be cheaper to build them on footing unless there are several of the kind, then it would be better to build them in sections, the bench wall frames and semi-circles being identical with each other The arch ring is built the same way, and for ring or head walls a sill of 2 by 6 should be laid on the footing to nail the studding to. When the studding is set up to the top of the wing, get the height of the wing at the top and bottom and cut the studding off three inches below these points, and put a plate 2 by 8 on top of them, as it will straighten them and hold them in line. When the back wing wall is cut off to receive

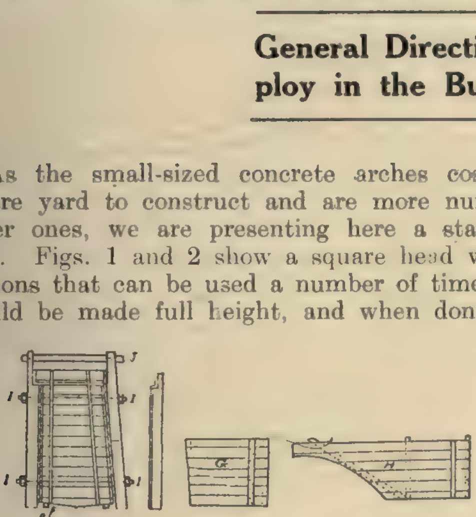


FIG. 1.

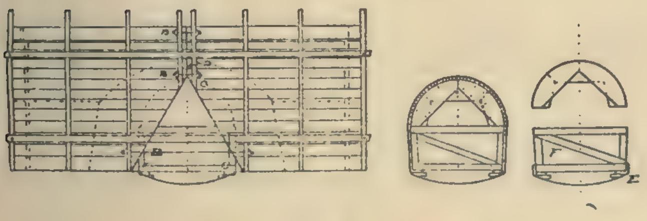


Fig. 2.

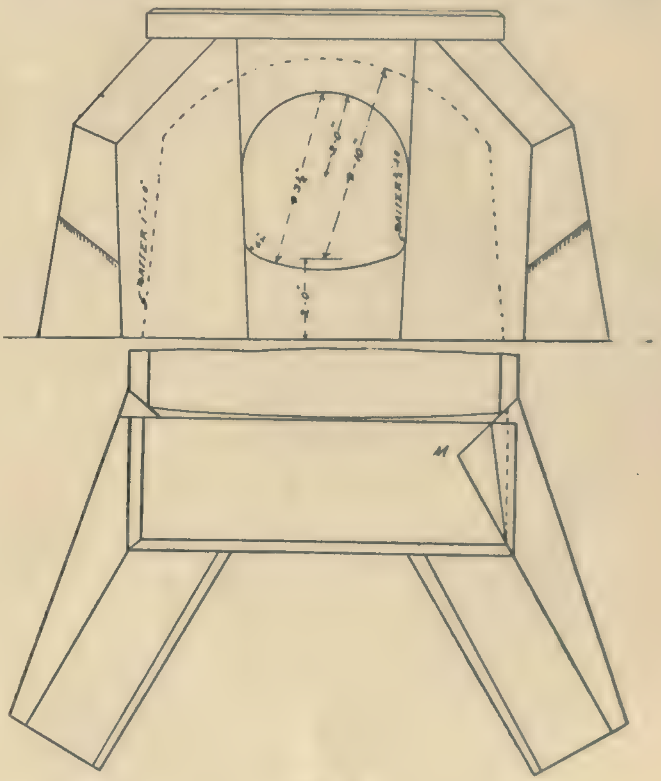


Fig. 3.

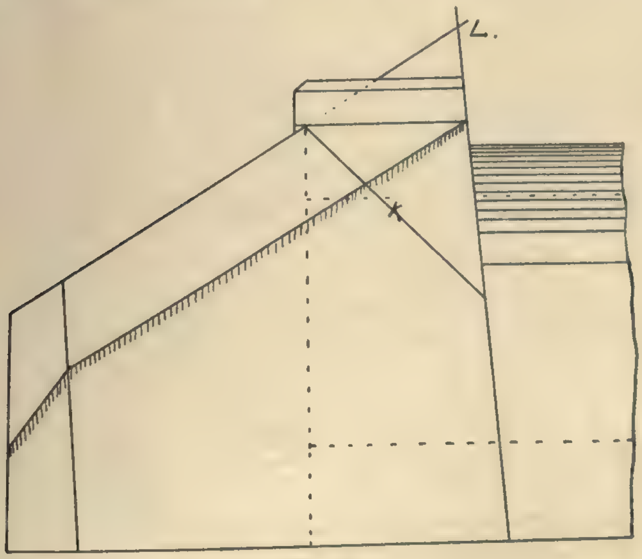


Fig. 4.

the coping it should be cut off as shown in K, fig. 4, as the 1½ to 1 slope line and the line of intersection of the wing and back wall, if continued, would cross each other at L, figs. 3 and 4. Cutting it off level would send the line to L, fig. 3, since it must come in line with the end of the coping. To find the distance down on back of wing for the lower end of cut, note the batter in inches per foot, and go down accordingly. A very sure way, since the centre line is established, is to take one-half of the length of the coping less the overhang at right angles to it, and drop a plumb bob to that point. The line will give the lower end of the cut. We have seen some badly twisted walls as a result of running the cut too high, or too low, as the case might be. Another cut in connection with the back wall which is very hard to figure out, can be made in the following manner: When the wing wall is on a 30-degree angle and the batter of 2¼ inches to one foot, and the back is on a batter of 1 inch to 1 foot, it is always best to build the back wall first and join the wing wall on. Put up the back wall to the correct batter, and when the studding is set for the wing to correct batter draw a line from the end of the wing at the same height as the top of the back wall (furring it out the thickness of the sheeting). Where it crosses the back wall will give the top, and as the bottom is already located, strike a chalk line from the two points and cut the end of back wall to it.

Cutting the front wing wall into the bench wall on a 30-degree angle at different batters is difficult for some, but suppose we have to join a wing with ⅞ of an inch to 1 foot batter to a bench wall 1 inch to 1 foot. After drawing a plumb line down the bench wall at intersections of the wing, and studding being set for the same, put a 2-inch block behind the board at each end and shove it down past the intersection. It is then easy to square out from the top to the bottom of the board on a line and find the proper cut for both the sides and edge of the board. Or if figures are preferred you can do as follows: Since we have a 30-degree angle and at 90 degrees we would have 1 inch batter, we find we would have ⅛ of an inch if the wing wall was plumb, but since we have ⅞ of an inch batter on the wing wall we find it will cut 7-32 out of square and that added to 11-32 will give 9-16 to one batter. This is not absolutely correct, but it is near enough for all practical purposes.—Cement World.

Practical Notes on Stair Building and Planning

A Few of the More Important Points to be remembered by the Builder and Designer—An Attractive Arrangement Shown

Until about the time of Queen Elizabeth, the stair case, now so important a feature in all houses, was of small size. Previously, stairs were built in every case on a circular plan, revolving around a central axis or newel. These were known as turret or corkscrew stairs. Stairs with wide straight flights were introduced during the sixteenth and seventeenth centuries and were made the leading feature in the mansions of the Elizabethan style. They were very massive in design with heavy oak balusters and enormous carved newels with ornamental panels. Many staircases of similar design but of lighter construction now exist in England, many of the more modern ones having cast-iron railings. In most houses built to-day the stairway is the most important feature. nevertheless its construction is frequently and, in fact, usually left with little thought as to design or convenience.

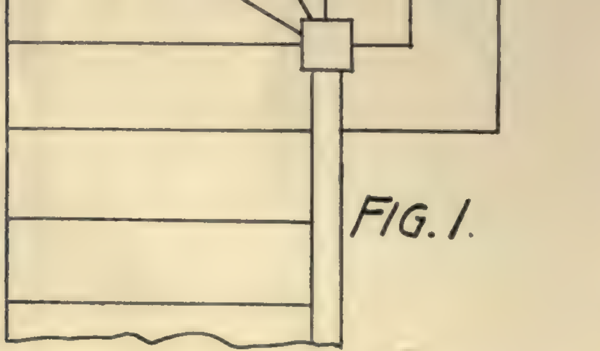


FIG. 1.

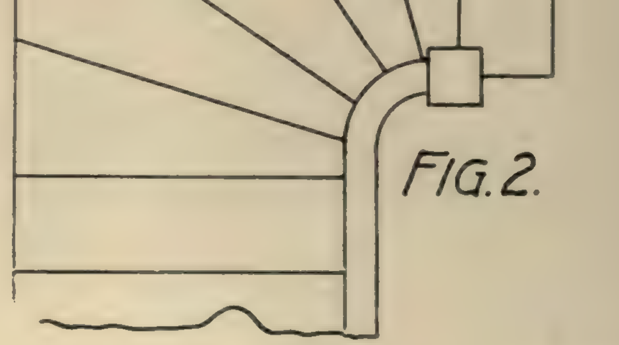


FIG. 2.

In planning stairways, care should be taken to have sufficient room so that the height of the riser is not too great. The distance from floor to floor in inches should be divided into a certain number of vertical distances, each of which is termed the rise and which is usually from 7 to 8 inches. A rule frequently applied in proportioning the rise to the width of the tread is, that the rise in inches multiplied by the run or tread in inches shall be about 70 or 75. According to this a 7-inch riser will call for a 10½-inch tread. It will readily be seen from this rule that the greater the rise the less the run, and the less the rise the greater the run, the proportions varying to suit different conditions.

Winders as shown in fig. 1 should never be used if it is possible to avoid them, their great objections being the narrowness of the tread along the line of travel, which is a line generally taken about 14 inches from the rail. Where they are absolutely necessary, it is better that the rail be made continuous with the ends of the treads in the form of a cylinder and the risers not radiating from a common centre, as shown in fig. 2. Where angle posts are used care must be taken so that they are centred on the angle posts. This should bring the outside balustrade flush with the finished string, as shown in fig. 3. The height of the rail should be about 2 feet 4 inches or 2 feet 6 inches above the tread, measured on a line with the face of the riser; and on landings the height of the rail should be 2 feet 8 inches above the floor.

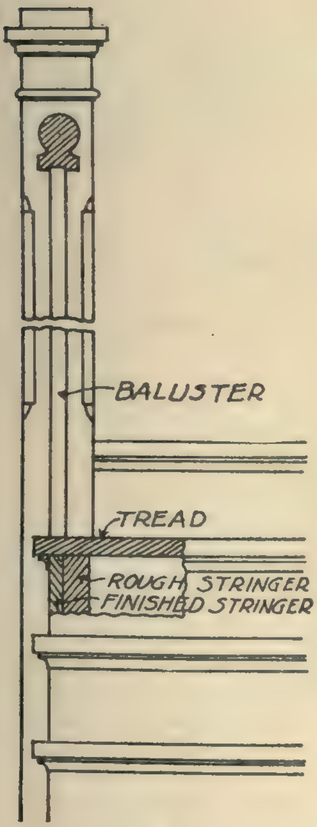


Fig. 3.

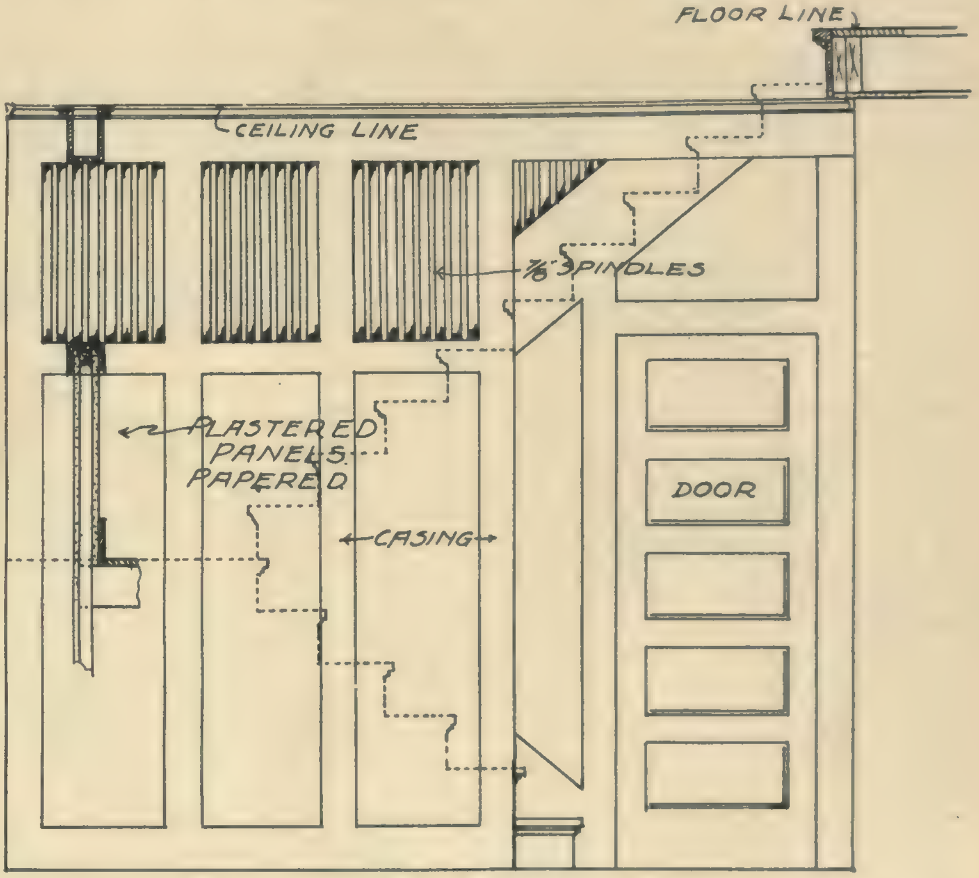


Fig. 4.

In these days the mills are very accommodating, and will, as a rule, work out any stair problems that the contractor may have. The principal thing for the carpenter to consider in planning a stair is to see that he has sufficient room to get the required number of steps and ample head room. If he is sure of these the mill will usually do the rest of the designing for him. In constructing the rough framework work the stairs, care must be taken to have the stringers sufficiently strong to carry the weight. They should be never less than 6 inches in the narrowest part. As a rule, it is best to put all of the rough framework for the stairs in place before the lathing and plastering is done.

fig. 4, is one of unusual beauty and convenience. It is a
The stairway shown in the accompanying drawing,
decided departure from the ordinary design and may serve as a suggestion or help in planning. There are many advantages to be gained in a stair of this kind, the principal ones being the saving of the cost of an open balustrade and the privacy obtained by the closed-in front, which is, however, so made as not to exclude the light. Economy of space and the triple use as front, back and cellar stairs in one, are also points to be considered.—American Carpenter and Builder.

The Toronto Viaduct Question

Apropos of the Toronto viaduct question, it is stated that no stone is to be left unturned by the railways to get from under the order of the Dominion Railway Commission. Their latest move is a revival of the Yonge street bridge case. Notice has been served on the city that the railways will move before the Court of Appeal to carry this case to the Privy Council. This is the case in which Mr. Justice Anglin refused to set aside the order of the old Railway Committee ordering the railways to build a bridge at the foot of Yonge street. It is said that the object of the appeal is to have the Privy Councillors say that this order should take precedence over the viaduct order.

Saskatoon, Sask., building permits for May were $146,985, and for the five months $327,085.

The cost of filtering water by the slow sand method is given as follows in the report of the Lawrence, Mass., Water Board. During that year 1,198,035,879 gallons were filtered at a total cost of $11,544.92, or about $9.68 per 1,000,000 gallons. The itemized cost per 1,000,000 gallons was: Removal of ice and snow, $3,094; scraping, $1,455; sanding, $0.87; washing and conveying sand, $1.849; filter maintenance and extras, $1.886; care of grounds, $0.524.

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

A New Method of Treating Sewage

By K. Imhoff.

In urban sewage about one-half of the organic matter is, in general, undissolved. This undissolved matter can be removed by mechanical means. The simplest method of mechanical purification consists in sedimentation, the suspended impurities being deposited, by gravity, as sludge. Sedimentation is dependent on time. The longer the period of clarification the more sludge is deposited. The separation is, however, very unequal. In the first few minutes the rate of separation is highest; thereafter the rate gradually decreases. This is shown by the curve in fig. 1, which may be taken as representing the average for normal municipal sewage. It will be seen that after one-and-one-half to two hours, 75 per cent. of the suspended matter has been separated. In the course of the following hours there is practically no increase of this percentage. The slight effect produced by extending the period of purification is by no means proportional to the increased cost of construction of the larger subsidence tanks required. In addition to this, protracted retention of the water in the tanks involves risk of putrefaction. For this reason alone the period of sedimentation should not exceed two hours. In the Fifth Report of the Royal Commission on Sewage Disposal a considerably longer period is indeed mentioned. For example, it is recommended with regard to subsidence tanks for preliminary separation of fine granular matter, that they should take the inflow of from ten to fifteen hours. This may have its explanation therein that the space occupied by the sludge is included in the calculation, and that the reference is to sewage works in which the subsidence is disturbed by activity in decomposing sludge. It may be mentioned that the percentage of separation varies considerably in different sewages. In the case of dilute sewage, it is usually lower than in the case of concentrated sewage. The curve is consequently sometimes flatter than in fig. 1, and sometimes less flat, but it is always of the same type.

Besides the length of the treatment, which is the main factor in sedimentation, a number of secondary factors have to be taken into consideration in the construction of subsidence works.

In tanks in which the sewage flows in a horizontal direction, the depth largely influences the result. Shallow tanks are better than deep ones. The velocity of the water in these tanks within the limits occurring in practice is without material effect, provided the necessary time is given. However, the velocity must not be so great as to cause agitation of the settled sludge.

It is important to construct the inlet and outlet in such a way that the water is uniformly distributed throughout the entire width. The whole construction must be so designed that changes of temperature do not give rise to current which carry insufficiently cleared water to the outlet.

The separation of the minutest (colloidal) suspended particles is favored by affording large surfaces on which these particles can settle. The best arrangement hitherto designed for this purpose is that indicated by Mr. Travis. This consists in placing vertical, thin walls in the longitudinal direction of the tank. These walls fulfil their purpose without obstructing the flow of the water.

Finally, it is, as already indicated, of extreme importance that the sedimentation is not disturbed by activity arising from decomposition of the sludge. The best way of preventing this is to provide for automatic removal of the sludge from the tank proper as soon as it is deposited.

Treatment of the Sludge.

The treatment of the sludge is equally as important as the purification of the sewage. Sewage works in which the question of the sludge treatment is not satisfactorily disposed of cannot in the long run fulfil their primary purpose, i.e., that of purifying the water. It is not sufficient to provide only for effective sedimentation of the sewage. It is equally essential to provide for efficient removal of the sludge, and for the further treatment thereof, even if provision for these matters involves some departure from the ideal process of sedimentation pure and simple.

The plant must, in fact, be the result of a compromise between the requirements of sedimentation on the one hand and of sludge treatment on the other hand

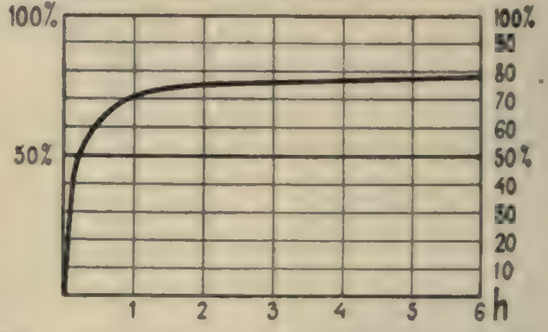


Fig. 1.—Rate of Sedimentation of Undissolved Matter.

The sludge pumped in a fresh state from the tank has very unfavorable qualities; it contains much water, and is consequently of large bulk; it dries with difficulty and passes while drying into a state of odoriferous putrefaction. Industrial utilization of the sludge (for example, for the production of fat) has not hitherto proved successful on a large scale. The best manner of dealing with the sludge is still the treatment in septic tanks, known of old. The sludge is by this treatment reduced in bulk; the drying thereof is facilitated, and it is rendered odorless.

If it is preferred to allow the sludge to decompose it is advisable to combine all residues with the sludge—that is to say, to retain only the coarsest obstructions at the gates, and to dispense with a sand collector provided that the sludge mixed with sand is capable of conveyance. It is important in this respect that the sand is mixed as uniformly as possible with the sludge at the time of the sedimentation.

Tanks as Self-Acting Sewage Works.

Based on these principles a new process of sewage purification has been adopted on a large scale in a German district.

The sewage plant consists essentially of deep tanks, which receive the sludge. In the upper part of these tanks the subsidence chambers through which the water flows are divided off by partitions. The floors of the subsidence chambers are inclined, and the sludge slides down them, in order to pass through slots into the sludge tanks. Without supervision or attendance the sludge is, therefore, continuously and promptly removed from the subsidence chamber. The sludge accumulates in the tanks, and the sludge tanks gradually develop into septic tanks. Only the sludge, however, is decomposed. The flowing water is kept free from putrefaction. If putrefaction has already occurred in the water, it is at least not furthered in the tank.

The tanks are used either singly or in series. Both methods are illustrated in the accompanying diagram.

Fig. 2 shows sewage plant comprising two tanks, for a population of 10,000. A subsidence basin is arranged above the two tanks. It is important that each tank receives the same amount of sludge, so that decomposition occupies the same time in each tank. For this reason, the direction of flow is changed at intervals of a few weeks, so that each tank in turn is first in the series, and receives the greater influx of sludge. This also has the result that all the tanks receive sludge of the same kind; without the change, one tank—namely, the first in the series—would receive a large proportion of sandy, solid sludge, and the other tanks organic, liquid matter. To allow of admitting the water from both sides, an annular channel is formed at the edge of the tank.

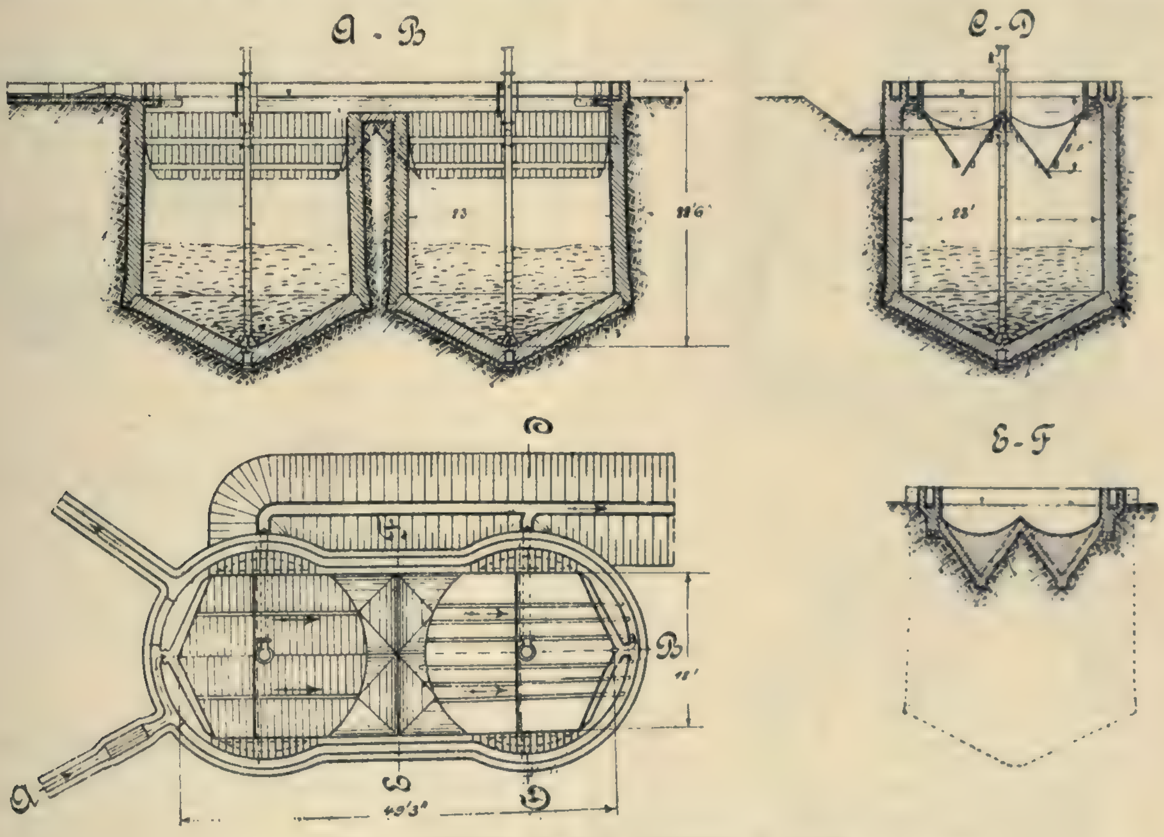


Fig. 2.—Clarifying Plant for Population of 10,000.

Fig. 3 shows a single tank for a population of 5,000, designed for the treatment of sewage in which the proportion of water to sludge is higher than in the case of the sewage treated in the apparatus shown in fig. 2. The water is in this case supplied at the centre, and flows radially outwards, to overflow at the edge. In the course of its outward flow the water must first descend, and then ascend, along the wall of a cylinder suspended in the tank. The sedimentation consequently takes place while the water is flowing vertically. It is essential that the velocity of the ascending water is not greater than the velocity of the sinking particles.

The sedimentation in tanks of this kind is at least equal to that in well-designed subsidence tanks of other type, size and time being equal. The decomposition taking place in the sludge chamber has practically no unfavorable effect on the condition of the water flowing through the subsidence chamber.

The sludge in the sludge tank acquires the same favorable qualities as that treated in other septic tanks. Its bulk is reduced to about one-quarter of the original bulk, partly by evolution of gas and partly by reduction of the percentage of water. The sludge becomes odorless, dries easily, and may then be utilized for agricultural purposes, or for filling purposes, or it may be burnt.

The great depth of the chambers favors the process of decomposition, inasmuch as the temperature is more regular. The depth also has a favorable effect on the final condition of the sludge, particularly with regard to the percentage of water in the sludge.

From the septic tank the sludge is conveyed through pipes to the drying beds. The pipes are shown in fig. 2. If the beds are at a lower level the sludge may flow to them by gravity, a gate at the orifice of the lateral pipe being opened for this purpose. If there is no "head" the sludge is pumped from the upper end of the pipe. The sludge generally flows out with great readiness, having lost its stringy nature. It is a black mass, and liquid, notwithstanding that the proportion of water is only 75 or 80 per cent. Water may be admitted from pipes at the bottom of the tanks, for the purpose of diluting the sludge, and starting its flow, but this is only necessary if the sludge contains an exceptionally large proportion of sand.

The size of the sludge tank is dependent on the length of time required for decomposition of the sludge. The time varies considerably in different places. The average may, perhaps, be stated as one-and-a-half to three months. More time may be required at first until the tank has become "seasoned." In designing the tank a margin is preferably allowed as regards size, so that sludge may be allowed to accumulate in case the drying or depositing beds should temporarily cease to be available.

The size of the subsidence tank or basin is solely dependent on the quantity of sewage to be dealt with and the period required for subsidence. No special allowance need be made for possible accumulation, since the working need never be interrupted. Neither is it in most cases necessary to make allowance for increase in the bulk of the sewage by rain water; the tanks can deal with sewage diluted by rain to from three to five times its normal bulk, the period required for purification being proportionally reduced. The subsidence and septic tanks are collectively no larger than ordinary subsidence plant. Moreover, inasmuch as the circular tanks can have very thin walls, the cost of construction is in most cases less than that of ordinary subsidence plant. The attention required is practically limited to the removal of the sludge drawn from the tanks. The working expenses are accordingly small, in the absence of all complicated apparatus.

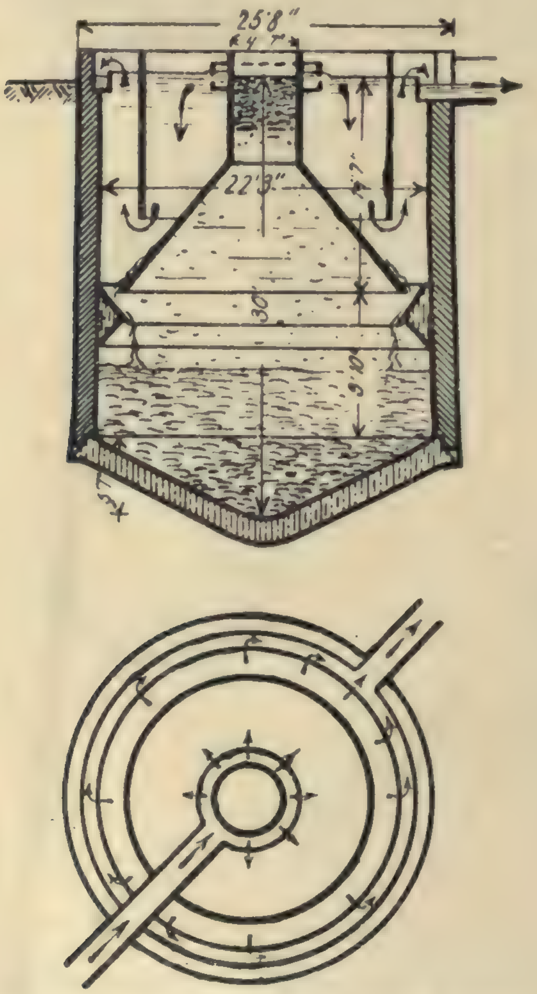


Fig. 3.—Clarifying Plant for Population of 5,000.

The Tanks in Conjunction With Bacteria Beds.

Where the water freed from sludge is sufficiently dilute, and can be discharged into a well-regulated watercourse, no further purification is necessary. Otherwise, bacteria beds are provided. In such cases the tanks are used for preliminary purification. The tanks are specially suitable for this purpose, for the reason that the water is not contaminated.

Opinions on this point still differ, however. Nevertheless, the view that it is preferable to supply fresh water to a bacteria bed, as to a river, appears to be gaining the upper hand. The beds are in that case capable of more work—that is to say, they can be of smaller dimensions for given requirements. But apart from this, an important advantage derived from keeping the water fresh lies in the fact that fresh water spread on bacteria beds evolves much less odor than water containing sulphuretted hydrogen.

There is an increasing tendency to avoid the use of ordinary septic tanks for preliminary purification on account of the odors arising therefrom. The known disadvantages of ordinary subsidence works are often preferred. The new system will prove of great advantage, the water being kept fresh and odorless, as in the su sidence treatment, and the sludge being dealt with as satisfactorily as in any septic tank.

In the case of percolating beds, it is usual to subject the discharge from the beds to a process of mechanical purification, in view of the large amount of sludge carried from the beds. The sludge separated by this purifying process is also capable of decomposition and has the same properties as the sludge separated by the preliminary purification. Emscher tanks can be used also for the treatment of the discharge from the beds, but in this case the subsidence tank must be designed for only one hour of deposition, the sludge tank being usually about one-quarter of the size required for preliminary purification. The proportions vary, however, greatly.

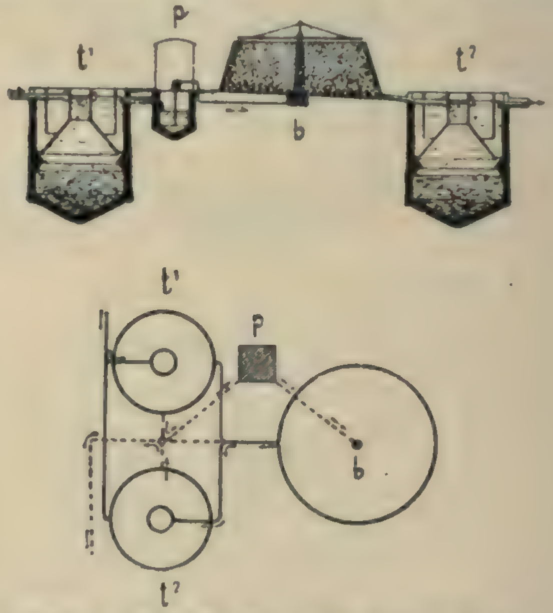


Fig. 4.—Clarifying Plant with Bacteria Beds.

If tanks are used for preliminary and subsequent purification in connection with beds, it is of advantage to arrange them so that they can occasionally be interchanged, as shown in fig. 4, in which t^1 is the tank for the preliminary purification, p the pump, b the bacteria bed, and t^2 the tank for final purification. This arrangement has the advantage that the sludge of preliminary purification can be directly mixed with that of final purification. Besides other advantages, more uniform decomposition is thereby obtained. The arrangement has the further advantage that the tanks can supplement each other in case of need, rendering special "stand-by" tanks unnecessary.—"Municipal and County Engineer."

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MANUFACTURERS OF
Building Granite, Granite Setts, Curbing, Etc.

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MANUFACTURERS OF

"HERCULES" Brand of PORTLAND CEMENT

Very finely ground. Unsurpassed for Sidewalks, Floors and all work requiring the highest grade of Portland Cement. For prices address

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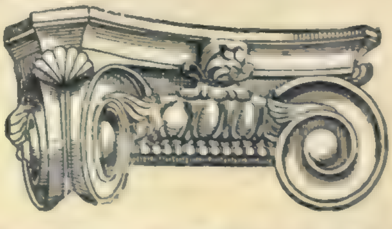

Centre Pieces, Capitals, Brackets, &c.

Interior and Exterior

Modelling and prices given. Send for Catalogue

J. CLAPHAM & SONS
14 Main St. East - - HAMILTON, Ont.

A Successful Concrete Industry at Kemptville, Ontario

The Dominion Concrete Company, Limited, of Kemptville, Ont., after a record of eight years of experiment and persistent development, claim to have attained the distinction of being the largest manufacturers of concrete culvert and sewer pipe in eastern Canada. Their new yards and buildings, an illustration of which appears on this page, cover an area of five acres extending along the St. Lawrence & Ottawa line of the C.P.R. The proximity of the Rideau Canal and the privately-owned siding afford every facility for unloading the cement and raw materials, while at the same time it enables the heaviest pipe to be loaded with comparatively little handling. The centre building shown in the cut is the main mixing camp, where the stone and sand are graded, mixed with the cement, and carried out on trams to the different gangs on the moulds, where it is reinforced and moulded. At intervals throughout the yard small hydrants appear, and from these the pipe are continually watered until matured, when they are dated and rolled into place awaiting shipment.

View of Dominion Concrete Company's Tile Yard at Kemptville, Ont.

The proximity of all the raw materials and the system by which they are manufactured into the finished product, enable the company to place upon the market a pipe containing a high percentage of cement at a very reasonable price. This, the company claim, enables the contractors at a distance to purchase a high grade pipe and place it in construction at a cheaper cost than if manufactured at the place of requirement.

The company state that all their products are absolutely frost proof, a fact which they say has been proven by the tests of engineers and by the experience of railways and municipalities throughout Canada. Among their large customers are the C.P.R., G.T.R., Grand Trunk Pacific, Intercolonial, the Brockville & Westport, the Central Ontario, the Temiskaming & Northern Ontario Railway, and the Ottawa & New York Railway, along with a great number of municipalities.

Another interesting branch of the business is the manufacture of hollow concrete building blocks, reinforced door sills, window sills, lintels and chimneys. The blocks are of all varieties, designs and thicknesses, while the company's varied experience enables them to overcome all difficulties in regard to plinths, sills, lintels, arches, keys, furring or strapping, bay angles, joists, cornices, etc. The blocks when used in building have the appearance of handsomely cut stone and also possess durability. The ease and rapidity with which a building is constructed out of these blocks makes them a great time saver and is making them a popular building material. As an entirely original idea, the company manufacture a reinforced sectional fireproof chimney which anyone can construct in a short time and which, we are told, has proven itself fireproof and practically indestructible.

It has, of course, taken some time to prove the efficiency of concrete to satisfy a great need in construction work, and it was only by perseverance and a firm belief in the great utility of concrete products, by careful experimenting along practical lines and by a determined desire to satisfy the increasing demand with the best that could be produced, that the directors of the Dominion Concrete Company, Limited, worked out the transformation of the gang in the gravel pit to an incorporated company carrying on one of the largest and most progressive concrete industries in eastern Canada. The officers of the company are: W. H. Anderson, president; A. Langstaff, secretary-treasurer; W. Dillane, general manager.

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are being manufactured and installed by us. Our facilities for executing High Class Marble Work of any description are unequalled, and we are equipped to meet any requirements.

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Special attention given to getting out material to Architects' details.

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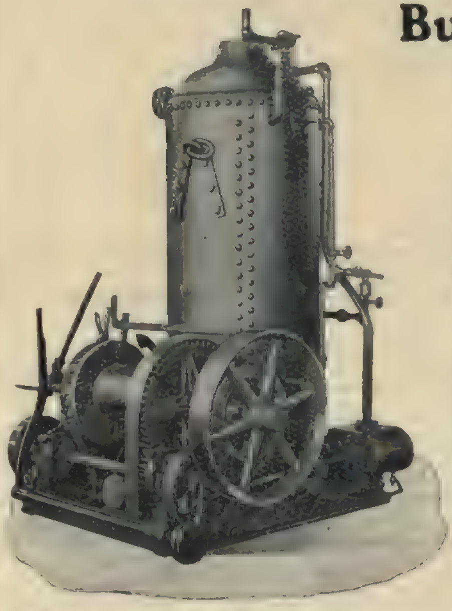

will elevate your Brick Mortar, etc., under ordinary conditions at the rate of ten feet a second.

It will also operate a Derrick, Do Sheet Piling, Run a Circular Saw or operate a pump.

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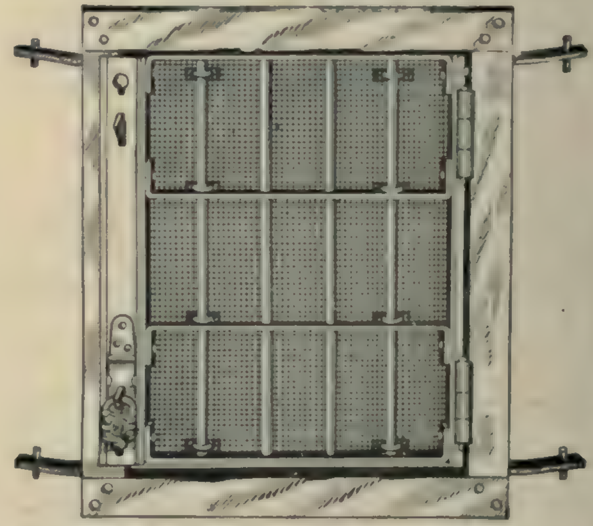

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That can be Produced Anywhere

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HARDWOOD FLOORING

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Modern facilities for every class of wood-carving, completed quickly, thoroughly economically.

Catalogue upon request.

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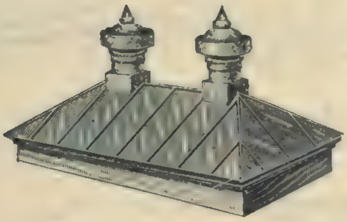

Our ACORN System of Skylight Construction gives the greatest strength and the maximum of lighting surface, at the same time. We can quote tempting prices on these Skylights, which have been used on some of the largest jobs in Canada.

Write us about our ACORN system, and we will send you literature telling all about our Skylights.

Metal Shingle & Siding Co. Limited

Preston and Montreal

The Gist of the Matter

Church of the Sacred Heart, Montreal, P Q Roof Steeple Pinnacles and Cornice painted with Sublimed Blue Lead

As Solomon urged men to get knowledge and understanding, so we are trying to help Engineers and Architects to an understanding of facts pertaining to the preservation of Structural Iron and Steel Work.

The average paint coating is only three one thousandths of an inch thick, yet this thin coating is required to withstand expansion, contraction, wear from storms of dust, sand, rain or sleet.

Natural Blue Lead

covers from 500 to 600 sq. ft. two coats, per gallon. Its durability, and powers of preventing corrosion have been found to excel that of any other pigment. Its elasticity is perfect, and as a coating it is not affected by either contraction or expansion of the metal. We want to impress these facts indelibly, so that if you have not been doing so, you can in the future specify BLUE LEAD. Samples and prices submitted upon request.

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FOR CONTRACTORS

The ribs in Herringbone Lath act as stiffeners and allow the spacing of furring strips to 16″ on centers instead of 12″. Suppose you are using 1½″x 1″ strips costing $50.00 per M. in place. One square yard of strips 12″ on centers costs 7.5 cents. At 16″ on centers they cost 5.62 cents. The difference is profit for Herringbone users.

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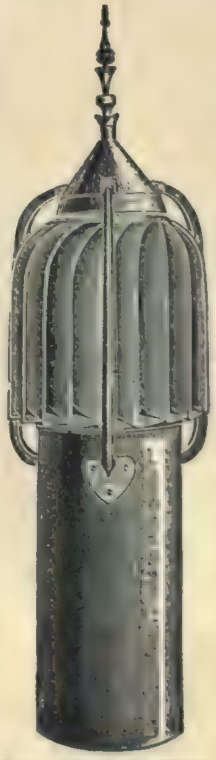
Metal Shingle & Siding Co., Manufacturers

It Saves Lives



(Can be supplied in copper, if so desired.)

A Building Necessity

These are the names that have been made synonymous with the

"J. W. Harris Rotary Ventilator"

We are manufacturers of it and control the patents.

We have placed it on some of the finest buildings in the Dominion.

It is a scientific fact that no modern buildings can afford to neglect sanitation.

We are Contractors and sanitary experts. Our Ventilator is guaranteed and is placed in position to suit the building as to quality and size.

One Testimony:

Montreal, February 5, 1909.

Messrs. J. W. Harris Mfg. Co., Lt.,
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Gentlemen :—

In answer to your favor of the 14th ult., we have much pleasure in saying that the two **18" "J. W. Harris Rotary Ventilators"** you placed on my warehouse in January, [illegible] have given us entire satisfaction and can certainly recommend them as possessing all the qualities you claim for them.

Yours truly,
J. M. Orkin & Co.

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J. W. Harris Mfg. Co. Limited

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S. S. SELMAN, President A. G. McGREGOR, Gen. Manager

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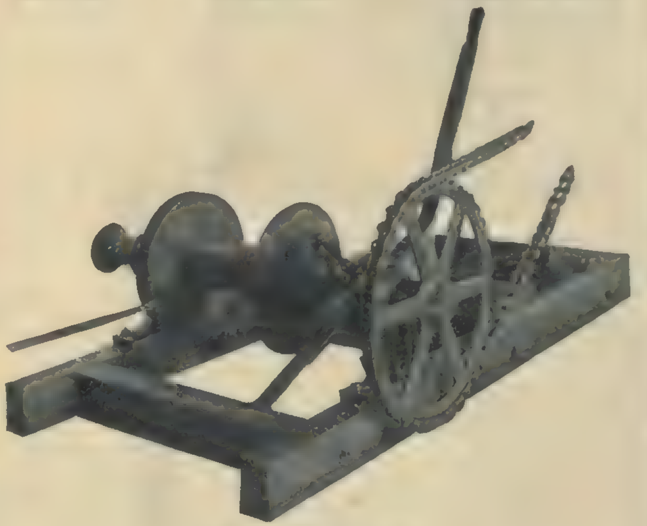
FOR WATERWORKS SYSTEMS

We undertake the installation of complete Water Systems. Supplying Pipes, Hydrants, Gatevalves, Special Castings, Etc.

The "London" Hoist

Friction Clutch

SIMPLE - DURABLE - INEXPENSIVE



Size 40 inches by 8 feet.

Designed and perfected for use with any style or size of engine. It is complete with our powerful "**London**" Friction Clutch and a brake of band type with foot lever and rachet.

Catalogue 21 G

The Scott Machine Company
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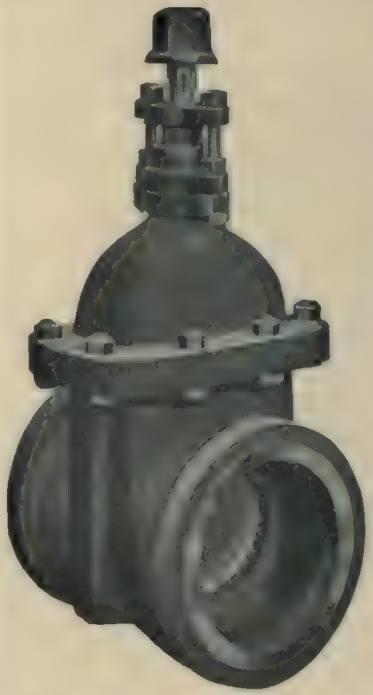
Engineers and Machinists London, Canada

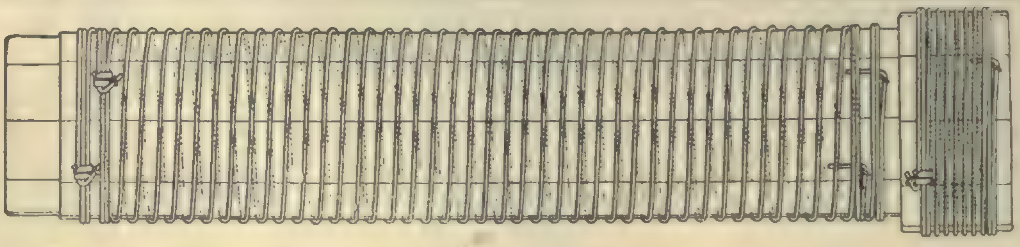


Towns
and
Cities

making extensions to, or installing systems of Water Works, should send us their inquiries regarding Hydrants, Valves and Valve Boxes.

We are specialists in the manufacture of these goods and our prices are right.

The Kerr Engine Company
Limited
Hydrant and Valve Manufacturers
WALKERVILLE, Ontario



End View of Pipe and Coupling.

The Dominion Wire Wound Wood Water Pipe

Showing special method of winding with two independent parallel wires. The great advantage of this is that in event of one wire becoming damaged the pipe still retains a factor of safety of 2.5. Made only by

The Dominion Wood Pipe Company, Limited New Westminster, B.C.

Also Manufacturers of Continuous Stave Pipe for Irrigation and Power Purposes. Write for Catalogue.

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THE GARTSHORE-THOMSON PIPE & FOUNDRY CO.
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Flexible and Flange Pipe, Special Castings and all kinds of Waterworks Supplies.

CAST IRON PIPE

3 inches to 60 inches diameter

for Water, Gas, Culvert and Sewer

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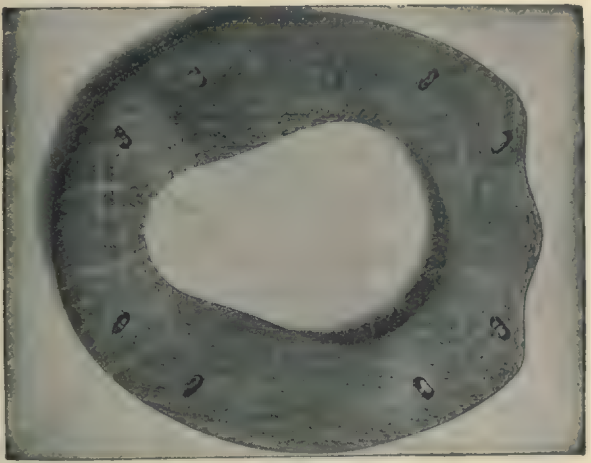

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Glue loses most of its adhesive power in time when subjected to widely uneven conditions of moisture and heat. This fact is responsible for the production of "NEVER SPLIT" SEATS. This seat, of which we hold the Canadian patents, is held together by bolts, nuts and washers imbedded in the wood.

No wordy argument necessary to impress on any practical mind the advantages of this method of closet seat construction. Write for catalogue on sanitary woodwork.

We sell only to the jobbing trade. It will be to your interests to specify our goods when ordering.

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Selling Power can be added to a building by furnishing with attractive

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Architects and Contractors should not lose sight of this fact when specifying and constructing. The small cost is amply repaid and the general appearance improved.

We manufacture and stock various woods in

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Complete catalog mailed upon request.

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Iron Ore, Pig Iron, Car Wheels, Cast Iron Water and Gas Pipe, Specials, Valves, Hydrants, Etc. Castings of All Kinds.

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of all designs in both iron and steel; Roofs, Telephone Poles, House Girders and all kinds of Structural Iron Work.

Our stock in hand comprises Steel Beams, Angles, Tees, Channels, Plates, Rolled Edged Flats, Bars, Rivets, Rounds, &c.; Iron Beams, Bars, Squares, Turnbuckles, Rivets, &c.

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Steel Buildings
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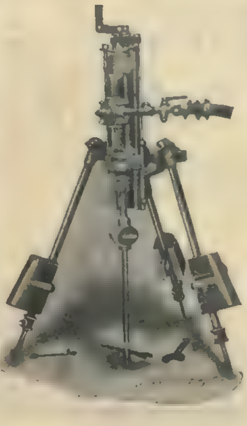

Mining Hoists and Rock Drills

What a Customer says:
"Drills we got from you six years ago are still in use."

Let us quote on your requirements

Dominion Rock Drill Co.
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PROTECT YOUR STAIRS, PREVENT ACCIDENTS, AND ARE GUARANTEED AGAINST THE HEAVIEST TRAFFIC FOR 25 YEARS. FOR WOOD, IRON, STONE, OR CONCRETE STEPS. MANUFACTURERS

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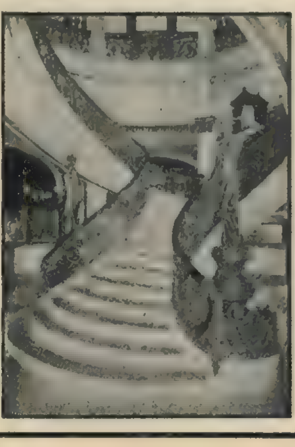

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J. & J. Taylor
Toronto Safe Works
Established 1855 TORONTO

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STEEL WINDOW SASH
MADE IN CANADA for
Factories, Foundries, Warehouses, Banks and Libraries
FIREPROOF AND WEATHERPROOF
Write for prices. - Then compare with wood.
Expanded Metal and Fireproofing Co., Ltd.
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Suitable for Sprinkler Systems
Fire Protection Water Supply
Plants, etc.

Steel Substructures of all kinds
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Windmills, Gasoline Engines,
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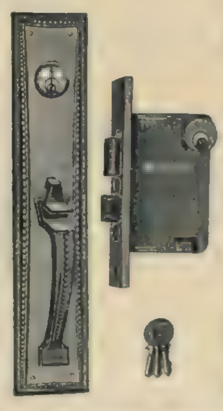
Showing construction of Mail Job Printing Co's. building, cor. Adelaide and Duncan Streets, Toronto—Leach Concrete Co., Contractors.
We are contractors for Stable Floors Tanks and Construction Work of all kinds. Write to
LEACH CONCRETE CO., 100 King Street West, Toronto



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You may have mailed free to you to-day a catalogue of the

"Belleville" Brand of Builders' Hardware

This book has been made up specially for the use of Architects.
The "Belleville" brand of Builders' Hardware is of such excellent quality and finish, that you should specify it for all buildings. No other firm in Canada is placing as high class an article on the market as is advertised in this catalogue.

Belleville Hardware Co.
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Established 1872 at HAMILTON, CANADA

BRIDGES
Railway and Highway

Structural Steel
5,000 Tons of Steel in Stock
Beams, Angles, Channels, Plates, Etc.

Manufacturers of Locomotive Turn Tables, Roofs, Steel Buildings, and Structural Steel Work of all descriptions

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CRUSHED **ALL SIZES**

For Concrete Construction, Roadways and Sidewalks, we carry a Light Weight Stone, specially suited for **Reinforced Construction Work.**

Our Roadway Stone is best on the market for Roadway Work, having those Qualities esssential for this Class of Work.

Prompt Shipment via C. P. R. and Grand Trunk.

Phone Main 5377 or Write

Christie, Henderson & Co., Limited

Head Office: **34 Yonge Street, Toronto**

Give Us a Trial Order for

House Trim **Base, Casings, Mouldings of all kinds, Hardwood and Pine Flooring, Doors, Sash and Frames**

We are equipped and have the workmen to turn out the highest class of **Interior Work**—Stair Building, Panel Work, Grilles and Store Fittings.

Try us on Built Columns, Turned and Built Newels and Veneered Doors.

We supply material in assorted car lots, rough and dressed lumber, shingles and lath, and will gladly quote a delivered price on your requirements.

A card from you will bring a call from us

Georgian Bay Shook Mills, Limited

Midland, Ontario

Contracts Department

News of Special Interest to Contractors, Engineers, Manufacturers and Dealers in Building Supplies.

Information for insertion in these columns is invited from Architects, Contractors, Engineers, etc.

Waterworks, Sewerage and Roadways

Burnaby, B.C.

The ratepayers have approved a bylaw to expend $150,000 on road improvements.

Brandon, Man.

Tenders will be received by the city for supply of creosote wood paving blocks. (See advertisement.)

Cornwall, Ont.

Tenders for widening and deepening the Butternut Creek drain will be awarded on Lot No. 10 in the 10th concession of Cambridge Township at 1.30 p.m., July 2nd. The estimated quantity of excavation is 11,658 cubic yards of earth excavation, and 225 cubic yards hard pan. Tenders will also be asked for the construction of a timber box culvert and one reinforced concrete culvert. Further particulars of W. H. Magwood, civil engineer, Cornwall.

Hull, Que.

The council will ask the ratepayers to sanction the expenditure of $30,000 on the purchase of new water works pumps, and $23,000 for extensions.

North Battleford, Sask.

The time for receiving tenders for proposed water works and electrical lighting system, has been extended to Friday, July 9th, 1909. (See advertisement.)

Moose Creek, Ont.

Tenders for excavation and completion of the McKenzie drain and McRae branch running through the 5th, 6th and 7th concessions of the Township of Roxboro' will be received until July 12th by F. D. Brunet, township clerk of Roxboro.' The engineer's estimates for the McKenzie drain exclusive of grubbing and road bridges is $3,989.40, and for the McRae branch, $920.20.

Ottawa, Ont.

Drainage systems for Westboro, Hillson avenue, Fallowfield and North Gower, all under the control of the Nepean council, are to be installed shortly. Mr. B. G. Street, Nepean township engineer, of Ottawa West, has prepared plans for the Westboro and Hillson avenue drains. Mr. J. H. Caldwell has prepared those for Fallowfield, and Mr. T. P. Baxter the plans for North Gower.

Prince Rupert, B.C.

Grant Bros., of Vancouver, have thrown up their contract for building the sewers here, and the work has been taken over by the Provincial Government. The contractors found their estiamte was too low.

Regina, Sask.

The city requests tenders for pavements throughout the city. (See advertisement.)

Tenders are invited by the city for the supply of sewer pipe. (See advertisement.)

Tenders will be received for numerous waterworks supplies for the city. (See advertisement.)

Stellarton, N.S.

Tenders for extending the water system to Lourdes will be received until July 3rd by J. W. Henderson, town clerk. The town will furnish the pipe.

Strathcona, Alta.

The ratepayers will vote on July 7th to authorize the issue of debentures amounting to $121,593, to be expended in part upon the building of plank and concrete walks, permanent improvements and extensions of the water and sewer system.

St. Louis, Que.

Tenders for concrete for asphalt side walks will be received until July 2nd by A. F. Vincent, secretary treasurer. J. E. Vanier, 5 Beaver Hall Square, Montreal, is town engineer.

Ste. Anne de Bellevue, Que.

It is stated that this town is prepared to grant a franchise for the construction of a waterworks system. Address J. Boileau, 26 St. James street, Montreal.

Toronto, Ont.

The Department of Public Works of Ontario is receiving tenders for regulating dams in Thunder Bay District. (See advertisement.)

The city is calling for tenders for motors and pumps. (See advertisement.)

Tenders will be called for supply of 26,000 feet of cast iron pipe for water main extensions.

Vancouver, B.C.

The tenders received by the Works Board for block paving Westminster avenue from the bridge to Seventh avenue are as follows: Palmer Bros., fir, $43,000; cedar, $32,500. Christian & Hartney, fir, $47,848; cedar, $44,787. Ironsides, Rannie & Campbell, fir, $50,204.75; cedar, $40,004.75. M. P. Cotton, fir, $45,154; cedar, $37,359. T. R. Nickson, fir, $46,300; cedar, $39,000. The board favored the use of cedar blocks in preference to fir.

Victoria, B.C.

The Esquimault Waterworks Company will shortly commence the construction of a pipe line from Goldstream that will deliver fifteen million gallons per day.

The Hassam Pavement Company have offered to lay a 6-inch pavement on Douglas street for $2.25 a yard.

Welland, Ont.

The town will construct sidewalks on a dozen various streets. G. R. Boyd is Town Clerk.

Woodstock, Ont.

Tenders will be received by the city clerk for various paving work. (See advertisement.)

Winnipeg, Man.

Tenders for supply of brass and galvanized fittings are invited until July 7th by M. Peterson, Secretary, Board of Control.

The Board of Control will recommend to council that the engineer of construction be instructed to proceed with the following works: Full width asphalt pavement on Fort street, from Portage avenue to York avenue, $26,166.76; twenty-four foot asphalt pavement on Henry avenue, from Chalmers street to west line lot 12, block 51, D.G.S. 35, St. John, at $15,059.10; a fifty-foot asphalt pavement on Portage avenue from Maryland street to Omand creek, $156,481.42; a twenty four foot asphalt pavement on Portage avenue, from Omand creek bridge to city limits, $16,818.70; a forty-eight foot asphalt pavement on Notre Dame avenue, from Nena to Maryland street, and then 75 feet wide from Maryland to the west line of D.G.S. St. James, $207,292.28. The Portage avenue and Notre Dame pavement will cost $380,591.

Tenders addressed to Hon. R. Rogers, Minister of Public Works, will be received until July 7th for dredging, excavation of laterals and clearing in drainage district No. 19, situated in the municipalities of Ochre river, St. Rose and McCreary. Plans and specifications at office of Chief Engineer, Department of Public Works, Winnipeg.

Tenders are invited until July 2nd for supply of 25,000 barrels of cement, f.o.b. cars, city yards. Address M. Peterson, Secretary, Board of Control.

Tenders for dredging, excavation and clearing in drainage district No. 8, will be received until July 6th by Hon. R. Rogers, Minister of Public Works, Department of Public Works, Winnipeg.

AWARDED.

Blenheim, Ont.

The contract for construction of tank and pumping station at the electric light power house was awarded to local firms as follows: J. H. Collier and D. H. Gray, a cement block circular foundation, 15 feet high and 12 feet in diameter, with door and window, the interior to be capable of use as storehouse. Cypress tank on top of foundation, 14 feet high and 12 feet in diameter. Price $500. Clunis & McIntyre, an International Harvester gas engine capable of lifting 2,000 gallons per hour. Engine, pump, etc., complete, $173.

Fredericton, N.B.

The City Council have awarded to the Hassan Paving Company, of Worcester, at $2.30 per yard, a contract for 4,000 square yards of street paving. The same concern was awarded a contract for 700 lineal feet of combined curbing and gutter at $1.25 per lineal foot. Four tenders were received and the contract was awarded on the recommendation of City Engineer Grimmer. The Hassam Company offered to do brick paving for $4 per square yard and compressed asphalt for $3.90. Their contract calls for Hassam cement paving and they offer a five years' guarantee. Other tenders received were C. J. B. Simonds and Brown & Maxwell, of this city, who offered to construct a brick street for $3.10 per yard; one of rock and cement at 98½ cents and one of macadam for 65 cents. For concrete curbing their offer was 59 cents per lineal foot. They were awarded a construct to construct two blocks of macadamized paving on King street and lay 700 feet of curbing at the figures named. Their prices for macadamizing are much lower than the city has paid for similar work in the past. The tenders of J. H. Dinsmore and G. Edwards, of St. John, was for concrete street at $2.25 per yard with no guarantee. J. H. Hague, of St. John, offered to construct granite block street for $3.50 per yard or scaled block street, $2 a yard.

Guelph, Ont.
For permanent road work, to be done this summer, the council has let the following contracts: Quebec street east (Penn vitrified brick), Blight & Fielder, Chatham, $4,594.97; $2.29 per square yard. Quebec street west (Penn vitrified brick), Blight & Fielder, $6,797.40; $2.18 per square yard. Paisley street (macadam), Conn & Company, $2,730.15; $1.25 per square yard. Macdonnel street east (concrete macadam), Blight & Fielder, $12,568.80. Woolwich street (cement macadam), Conn & Company, $32,155.75; $1.84 per square yard.

Toronto, Ont.
At a meeting of the council on June 26th it was decided to award the contract for the supply of centrifugal pumps to the J. Inglis Company, of Toronto.

Vancouver, B.C.
The Coquitlam Council has awarded contracts as follows: Gravel on Prairie road, Pringle & Leavell, 65 cents per yard; grading on Prairie road E. Simpson, $105; gravel on road north of C. P. R., E. Simpson, 65 cents per yard; gravel on Back Ditch road, J. R. Veale, at 85 cents per yard; ditching on Cole road, A. Jackson, $8 per chain.

Winnipeg, Man.
The Water Committee have confirmed the contract of the Robertson-Godson Company for four miles of water mains at $11,447.30. The same firm have secured the contract for the hydrants with adjustable cranes for use by the street sprinkler.

Railroads, Bridges and Wharves

Arnprior, Ont.
Tenders for steel bridge with concrete piers and abutments close July 3rd with Macullum and McAllister, Continental Life Building, Toronto.

Bellwood, Ont.
Tenders addressed to T. Goodall will be received until July 2nd for erection of concrete abutments for bridge for the West Garafraxa council. Plans and specifications at Mr. Goodall's office, Bellwood.

Calgary, Alta.
To get the plant on the ground for the Canadian Pacific's irrigation development along the Bow river the contractor has to build forty miles of a temporary railroad for supplies, etc. In the progress of the work over two million cubic yards of earth will be removed from the ditches.

Lepreau, N.B.
Tenders addressed to John Morrissy, Chief Commissioner, Department of Public Works, Fredericton, N. B., will be received until July 5th for re-building the New River Station bridge at this place. Plans and specifications at residence of J. Stafford, Lepreau, N. B., at office of Dr. Tyler, St. George, N. B., and at the Department at Fredericton, N.B.

Moncton, N. B.
The section of the G.T.P. between Moncton and Chipman will be completed this fall.

Middlechurch, Man. 4
Tenders for construction of a reinforced concrete culvert will be received until July 3rd by Alfred Masters, secretary treasurer of this municipality. Plans and specifications at Mr. Masters' office and at the office of the Chief Engineer, Department of Public Works, Winnipeg.

Ottawa, Ont.
Several route maps for new railways in the West were approved by the Minister of Railways on June 18th. The projected line from Prince Albert to Fort Churchill was approved from Prince Albert to the Pas, a distance of 350 miles. Other routes approved were the G. T. P. branch line from Biggar to Battleford; the C. N. R. from Prince Albert to Battleford; the G. T. P. Regina and Yorkton branches, and the C. P. R. Manitou and Moose Jaw branches.

Peterborough, Ont.
The County Council will expend $4,000 on bridge construction in the county.

Stratford, Ont.
The Parks Board are considering a proposition for the erection of two new bridges, at a cost of $7,000 or $8,000.

St. Thomas, Ont.
For special steel track in connection with Ross street subway, the following tenders were received: Montreal Steel Works, (f.o.b. Montreal), $1,447; Nova Scotia Steel Corporation, $1,485; Dawson & Company, Montreal, $1,559.

Sheffield, N.B.
Tenders addressed to John Morrissy, Chief Commissioner, Department of Public Works, Fredericton, will be received until July 5th for re-building the Little River bridge. Plans and specifications at the Department at Fredericton, at the local government rooms, St. John, N. B., and at the office of the Registrar of Deeds, Oromocto, N.B.

Toronto, Ont.
The G. T. R. recently had prepared an estimated of the cost of putting the old belt line in proper condition for operation. The figure is $60,000.

Vancouver, B.C.
A bridge will be erected on Ninth avenue east by the British Columbia Electric Railway.

Plans for a suspension bridge over the First Narrows have been submitted to the Park Commissioners by W. T. Farrell and R. W. Tyler.

Winnipeg, Man.
It is stated that the Hudson Bay and Pacific Railway will shortly start construction on a direct line from Fort Churchill to Fort Simpson. The project is backed by British capital.

AWARDED.

Bathurst, N.B.
The contract for the construction of a railway from the Drummond iron mines to Bathurst, where smelters and shipping facilities will be built, has been awarded to Wheaton Bros., of Folly, N.S.

London, Ont.
The joint committee of the county councils of Middlesex and Lambton have let the contract for the cement floor and abutments of the new bridge over the Aux Sauble river to Lev. Crouse, at $1,380. This completes the awarding of contracts for the work. The steel part of the bridge is to be built by the Stratford Bridge Company at $3,410. The new bridge will have a span of 140 feet.

Prince Rupert, Sask.
The Canadian Bridge Company, of Walkerville, Ont., has been awarded the contract for the construction of six steel bridges on the 100-mile section of the Grand Trunk Pacific Railway between Prince Rupert and Kitsalas canyon on the Skeena river. The total amount involved is between $350,000 and $400,000. Mr. H. Ferguson, of Toronto, has been awarded the contract for putting in the concrete foundations in connection with the bridge work.

Toronto, Ont.
Contracts were recently awarded for the construction of three new provincial bridges. The building of a tunnel bridge over the Mississauga river, in Algoma, was awarded to the Dixon Bridge Works, of Campbellford, at $4,892. The same firm also secured the steel work for the Dansey bridge, near Blind river, the contract for the substructure and filling being awarded to J. F. Boyd, Sault Ste. Marie. The entire construction of the bridge is to cost $3,500. The contract for a new bridge over the Madawauska river, near Matawatchin, in Renfrew county, also went to the Dixon Works, the price being $5,000.

Tenders were awarded recently by the Department of Public Works for a number of the bridges on the new trunk wagon road which is being built from Sudbury to Sault Ste. Marie. The successful tenderers were as follows: Bridge over Vermillion river at Whitefish, Dickson Bridge Company, Campbellford, $15,000; bridge over the Spanish river at Nairn, steel and concrete, Dickson Bridge Company, Campbellford, substructure, Green, Sinclair & Camppel, Toronto, $12,000; bridge over the Murdoch river in Nipissing, M. A. Piggott & Sons, Hamilton, $3,500; bridge at Courchasse Bay, William Doust, Township Cosby, $3,500; bridge over Wabigoon river at Dryden, Morrow & Beatty, Peterborough, $6,300. The contracts call for the work to be completed by October 1st, and tenders for the remaining bridges are now being called.

West Toronto, Ont.
The C. P. R. have let a contract for the extension of their erecting and machine shop to Bishop & Buchanan, of Owen Sound and Peterborough, at $30,000, and for remoulding the engine house to Green, Sinclair and McDermott, Owen Sound, at $16,000.

Yorkton, Sask.
The contract for eighteen miles of the Yorkton-Melville branch of the G. T. P. has been awarded to Rigley & Hyland, of Winnipeg, and that for the thirty-five miles of the Yorkton branch of the G. T. P. to McMillan Bros. & Kenny, of Winnipeg.

Public Buildings, Churches, Schools, etc.

Alexandria, Ont.
Tenders addressed to Rev. J. W. Dulin will be received until July 15th for the erection of a new Roman Catholic church in this town. Plans may be seen at Bishop's Palace, Alexandria.

Belleville, Ont.
A bylaw to raise $70,000 for the purchase of three school sites and the erection of school buildings will be submitted to the ratepayers.

Carlyon, Ont.
Tenders addressed to Geo. Cook, secretary treasurer, will be received until July

15th for kalsomining the walls and ceiling of school house, S. S. No. 13.

Carberry, Man.
Tenders addressed to W. Caithness will be received until July 5th for the erection of a solid brick church in this town. Plans at office of W. Isbister, barrister, Carberry.

Fernie, B.C.
The ratepayers have approved a bylaw to raise $15,000 for firehall purposes.

Fort William, Ont.
Tenders addressed to Stinson & Hood, architects, are invited for the erection of a band stand for the Fifty Thousand Club.

Tenders addressed to R. E. Mason, architect, will be received until July 7th for an addition to the Francis street school.

Killarney, Man.
Tenders will be taken at once for the erection of a new $10,000 town hall.

Kamloops, B.C.
Tenders addressed to F. C. Gamble, Public Works Engineer, Victoria, B. C., are invited until July 12th for the erection of a frame schoolhouse at this place. Plans and specifications at offices of Government Agent at Kamloops, B.C., and at the Department of Public Works, Victoria.

Kingston, Ont.
The Board of Management of the consolidated schools have decided upon the erection of a new building on the site of the one destroyed by fire this spring. Plans will be prepared at once and tenders called for in the near future.

Lindsay, Ont.
Tenders addressed to C. Callaghan, secretary, will be received until July 5th for an addition to Boys' R. C. S. School. Plans at Market Buildings, Lindsay.

Maxville, Ont.
Tenders addressed to R. A. MacDonald, parish priest, Greenville, will be received until July 3rd for the erection of a Roman Catholic church in this village.

Morris, Man.
Tenders addressed to W. W. Blair, architect, 414 Nanton Building, will be received until July 3rd for erection of court house building in this town. Plans at office of D. M. Ure, Morris, Man., and at Mr. Blair's office at Winnipeg.

Mount Royal, Man.
Tenders addressed to H. O. Ayearst, secretary treasurer, will be received until July 2nd for the erection of a woven wire fence around the Little Mountain school site.

Montreal, Que.
It is announced that the Grand Trunk has practically completed plans for an immense new terminal station, to replace the present Bonaventure station, which will be demolished. The new terminal, which will be up-to date in all respects, will, with the rearrangement of the tracks, entail an expenditure of over $2,000,000. The track, it is stated, will be elevated.

Tenders addressed to L. O. Davis, City Clerk, will be received until June 30th for repairs to city hall. Plans and specifications on application.

New Westminster, B.C.
A fund has been inaugurated to raise $75,000 for enlarging the Royal Columbian Hospital.

Ottawa, Ont.
Tenders on the new G. T. R. hotel are all in and have been sent to Ross & McFarlane, architects, Montreal, for report and award.

Tenders addressed to J. Henderson, city clerk, will be received until July 6th for the erection of a registry office. Plans and specifications at office of J. A. Ewart, architect, 193 Sparks street.

Regina, Sask.
Tenders for the erection of a hospital building will be received by the city until July 19. (See advertisement.)

Stellarton, N.S.
Tenders addressed to Dr. H. R. Munro, will be received until July 1st for erection of hall and remodelling of St. John's Church. Plans at office of W. C. Douglas, architect, New Glasgow.

St. Mary's Ont.
The ratepayers have defeated a bylaw to raise $40,000 for the erection of a public school.

St. Gabriel de Brandon, Que.
The parish church was destroyed by fire last week. It had already been planned to tear the structure down and erect a commodious new building.

Strathcona, Alta.
The ratepayers will vote on July 7th on a bylaw to raise $12,000 for the erection of a city office building.

Toronto, Ont.
The city council have approved the recommendation of the Board of Education to raise $405,000 for new school sites and extensions.

The estimates of the Board of Education for new school buildings have been approved by the Board of Control. Details are as follows: New building for Northwest High School, $150,000; addition to Riverdale High School, $5,000; enlargement of Balmy Beach School, four rooms, $25,000; enlargement of Kimberley Avenue School, six rooms, $35,000; new school on Jones avenue, eight rooms, $50,000; enlargement of new building to replace Parkdale school, $40,000; for new school to take the place of Elizabeth street school, $50,000; new sites and enlargement of present sites, $50,000; total, $405,000.

Victoria, B.C.
The School Board have adopted the plans of J. C. Keith for the new Moss street school, and have authorized the calling of tenders.

The School Board have purchased a site on Leighton road for a new school building.

Wetaskiwin, Alta.
A new brick school building is to be erected here at a cost of $25,000.

Winnipeg, Man.
It has been decided to enlarge St. Luke's Church at a cost of $12,000.

Tenders close June 30th for a brick and stone temple building for the Oddfellows. Jas. Chisholm & Son, architects.

Welland, Ont.
Tenders addressed to J. McCaw, Secretary, Public School Board, will be received until July 5th for a four-room addition to the central school and a two-room addition to the North Ward school. Plans and specifications may be seen at the store of D. McCaw & Son, Welland, and at the office of the architects, Ellis & Connery, 72 Queen street west, Toronto.

Yorkton, Sask.
Tenders addressed to N. Tessier, Secretary, Department of Public Works, Ottawa, will be received until July 2nd for electric light wiring and fittings for the post office. Specifications may be obtained from J. W. Christie, Clerk of Works, Yorkton, and at the Department at Ottawa.

AWARDED.

Fernie, B. C.
The contract for the construction of a new court house has been awarded to J. A. Broley at about $70,000.

Moose Jaw, Sask.
The contract for the erection of the new Empire public school of eight rooms, has been awarded to R. N. Willoughby. The heating and plumbing contract was awarded to the Moose Jaw Hardware Company. Tenders for the building were as follows: R N. Willoughby, $19,293; C. W. Hall, $20,776; Brandon Contracting Company, $22,956; E. E. Poole, $23,485; Navin Bros., $23,993; W. H. Ellis & Sons, $24,720; S. A. Covert, $24,880. For the heating and plumbing the tenders were: Moose Jaw Hardware Company, $4,598; James Ballantyne Company, $4,700; Higgins & Mohr, for plumbing only, $1,700.

Ottawa, Ont.
The contract for the erection of the Government experimental station for the testing of peat as a producer of gas has been awarded to Doran & Devlin, of Ottawa, at about $13,000.

Residences

Hamilton, Ont.
W. A. Noble will build a brick house on Bold and Hess streets at a cost of $2,500.

M. M. Webb, contractor, has purchased a large tract of land in the northwest section of the city, and intends erecting sixty-eight working-men's houses on it. A permit for the first batch was taken out last week.

Montreal, Que.
Mr. J. T. Davis has purchased the Lindsay property on Upper Drummond street and will erect a large modern residence.

Chippawa, Ont.
Tenders will be received until July 5th for the erection of a Presbyterian manse. Address C. McCredie, Chippawa, Ont. Architect, C. M. Borter, Niagara Falls.

Portage la Prairie, Man.
W. Moffat will build two residences on Lyon street.

Quebec, Que.
A. Grenier will build a $4,000 house on Dorchester street.

Vancouver, B.C.
L. D. Chesman has a permit for the erection of four houses on Seventh avenue to cost $10,000.

Winnipeg, Man.
Recent building permits include: P. Burns, house, Langside street, between Buell and Preston streets, $3,000; J. Schwab, three house terrace, north side of Manitoba between Main street and Charles street, $6,000; R. T. Riley, house, corner Assiniboine avenue and Blanchard street, $22,000, stable, $2,000; W. R. Driscoll, house on north side of Grosvenor, between Crescent and Ruskin Row, $8,000; M. Kantorovitch, three houses on south side of Polson, between Aikins and Powers streets, $3,600.

AWARDED.

Vancouver, B.C.
The contract for the construction of the new apartment house at the corner of Georgia and Bute streets, which Mr. James D. Bryce is building, has been awarded by Mr. Henry B. Watson, the architect, to Dissette & Dean. The cost is $75,000

Tenders and For Sale Department

City of Brandon, Manitoba

Tenders for

Creosote Wood Blocks

Sealed tenders, marked "Tenders for Wood Blocks" will be received by the undersigned up to 6 o'clock p.m. JULY 17th, for a supply of Creosote Wood Paving Blocks for Bridge Paving, etc. Price to be per yard, f.o b. Brandon, duty paid. Lowest or any tender not necessarily accepted.

HARRY BROWN,
City Clerk.

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City of Regina

Regina General Hospital

Sealed tenders, addressed to the City Clerk, Regina, Sask., will be received up to 5 o'clock p m., MONDAY, JULY 19th, 1909, for the erection of a Hospital Building at Regina, Sask.

Each application for plans must be accompanied by a marked cheque for $15.00, made payable to Messrs. Storey & Van Egmond, Regina, and each tender must be accompanied by a marked cheque for $5000.00, made payable to the City of Regina.

Plans specifications and forms of tender may be obtained at the office of Messrs. Storey & VanEgmond, architects, Northern Bank Chambers, Regina, Sask.

The lowest or any tender not necessarily accepted.

J. KELSO HUNTER,
City Clerk.

Regina, Sask., 23rd June, 1909. 28

City of Regina

Waterworks

Sealed tenders, addressed to the City Clerk, will be received until 5 o'clock p.m., MONDAY, JULY 19th, 1909, for the following:

A. Supplying 22,800 feet 18 inch Cast Iron Pipe and necessary Special Castings.
B. Supplying 7,350 feet 6 inch Cast Iron Pipe and necessary Special Castings.
C. Supplying Gate Valves and Valve Boxes.
D Supplying 12 tons lead pipe—200 curb boxes.
30 " soft lead

Specifications and other information will be forwarded on application to Angus Smith, City Engineer, Regina, Sask.

The lowest or any tender not necessarily accepted.

J. KELSO HUNTER,
City Clerk.

Regina, Sask., 23rd June, 1909. 28

City of Regina

Sewers

Sealed tenders, addressed to the City Clerk, will be received until 5 o'clock p.m., MONDAY, JULY 19th, 1909, for the following:

A. 1,800 feet 12 inch Sewer Pipe,
50 Junctions 6" off 12".
B. 1 200 feet, 15" Sewer Pipe,
50 Junctions 6" off 15".
C. 1,100 feet 18 inch Sewer Pipe
25 Junctions 6" off 18".

Specifications and other information will be forwarded upon application to Angus Smith, City Engineer, Regina, Sask.

The lowest or any tender not necessarily accepted.

J. KELSO HUNTER,
City Clerk.

Regina, Sask., 23rd June, 1909. 28

Wanted

Capitalist Partner to engage in the manufacture of stone, imitation of the best granite. Process secret. Can be sold in any district, much lower than other stone. Apply Box 787 CONTRACT RECORD, Toronto. 27

City of Regina

Pavements

Sealed tenders, addressed to the City Clerk, will be received up till 5 o'clock p. m., MONDAY, JULY 19th, 1909, for the following:

A. 1,000 lineal feet Curb and Gutter.
B. 5,000 square feet Cement Sidewalk.
C. 1,225 " yards Pavement

Specifications and other information will be forwarded upon application to Angus Smith, City Engineer, Regina, Sask.

The lowest or any tender not necessarily accepted.

J. KELSO HUNTER,
City Clerk.

Regina, Sask., 23rd June, 1909. 28

Tenders for Electric Motors and Turbine Pumps,

etc., etc.

The City of Toronto will shortly call for tenders on approximately the following apparatus:

2—1500 H.P. Induction Motors, direct connected to turbine pumps.
4—1500 H. P. Synchronous Motors, with turbine pumps.
4—500 H P. Synchronous Motors, with turbine pumps.
2—500 H. P. Induction Motors with turbine pumps
2—300 H.P. Induction Motors, with turbine pumps.
2—225 H. P. Synchronous Motors, with turbine pumps.
Together with Valves, Piping, Bed Plates, Couplings, Switchboards, Connecting Material, etc., etc.

For information apply City Engineer's Department, Toronto, Canada. tf

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Town of North Battleford

Province of Saskatchewan

EXTENSION OF TIME

The time for receiving tenders for proposed Water Works and Electric Lighting System has been extended to FRIDAY, JULY 9th, 1909, for the following sections of the work:

Contract "G" Furnishing and erecting Pumping Machinery.
" "H" Furnishing and erecting Boilers.
" "J" Furnishing and erecting Steam Engine.
" "K" Furnishing and erecting Electrical Equipment.

Plans and specifications may be seen at the following offices: Chief Engineer's Office, 103 Bay Street, Toronto; Chief Engineer's office, Room 47 Canada Life Bldg., Winnipeg; Secretary-Treasurer's Office, North Battleford.

No tender necessarily accepted.

S. COOKSON, Esq.
Secretary-Treasurer,
North Battleford, Sask.

J. A. GREGORY, Esq.
Mayor,
North Battleford, Sask.

WILLIS CHIPMAN, C. E.,
Chief Engineer,
103 Bay Street, Toronto, Ont.

26

City of Moose Jaw

Saskatchewan

Sealed tenders, addressed to the undersigned, will be received up to MONDAY, 19th JULY, in the Council Chamber between the hours of 8 and 8.30 p.m. for the following material:—

1—50 Light, Constant Current Transformer or Regulator with 35 Arc Lamps and suitable Switchboard with necessary instruments for controlling same.

A Contract for One Year's Supply of Watt Meters.

A Contract for One Year's Supply of Transformers.

Further particulars can be had at my office.
The lowest or any tender not necessarily accepted.

JOHN D. SIMPSON, Esq.,
Town Clerk.

28

To Contractors

Sealed tenders for the construction of Concrete Storage and Regulating Dams at the outlet of Great Dog Lake in the District of Thunder Bay, near Port Arthur, will be received at this department until noon of MONDAY, THE 12th JULY, 1909.

Tenders must be enclosed in a sealed envelope endorsed "Tender for Dog Lake Storage Dams" and addressed to the Honourable J. O. Reaume, Minister of Public Works, Ontario.

Plans and specifications may be seen and forms of tender obtained at this department and at the office of Mr. A. L. Russel, Civil Engineer, Port Arthur.

An accepted bank cheque, payable to the order of the Honourable J. O. Reaume, Minister of Public Works, for the sum of $2,000.00, and the bona-fide signatures and addresses of two sureties, or the name of a guarantee company, approved of by this department, prepared to give a bond for the due fulfilment of the contract must accompany each tender.

The department will not be bound to accept the lowest or any tender.

By order,
H. F. McNAUGHTEN,
Secretary Public Works.

Department of Public Works, Ontario,
Toronto, June 23rd, 1909. 27

Tenders Wanted

Sealed tenders, addressed to the undersigned, will be received until 4 o'clock p.m. of MONDAY, JULY 12th, 1909, for the erection and completion of a

Steel Bridge and Concrete Abutments

for the same in the Township of East Zorra, Oxford County.

Length of bridge, 30 ft. Width, 14 ft. Height of abutments, probably 12 ft.

Tenders to be for either beam or truss span anp capable of carrying a cement floor and 20,000 lbs. load.

Work to be completed on or before October 1st.

JAMES ANDERSON,
Clerk East Zorra.
Hickson, P. O., Ont.

26

Concrete Sidewalks

Sealed tenders, addressed to John Morrison City Clerk Woodstock, Ont , will be received up to 10 A.M. OF SATURDAY THE 3RD DAY OF JULY, 1909, for the construction of Cement Concrete Sidewalks and Curb and Gutter, during the season of 1909.

Specifications may be seen at the office of undersigned.

The lowest or any tender not necessarily accepted.

F. J. URE
City Engineer.

26

City of Brantford

Tenders for Pavement

Sealed tenders, addressed to Alderman John Moffatt, Chairman of the Board of Works, in care of the City Clerk, Brantford, Ontario, will be received until twelve o'clock, noon on THURSDAY, JULY 8, 1909, for the pavement of Chatham street from George to Peel streets.

(a) About 6,900 square yards of concrete foundation, including grading.

(b) About 6,900 square yards of top surfacing (tenders for different kinds will be received).

(c) About 4,600 lineal feet of concrete curb and gutter.

Separate tenders are required for a, b and c.

A guarantee bond for the maintenance of the pavement for five years will be required.

Plans and specifications may be seen and instructions to bidder and forms of tender obtained at the City Engineer's office. Each tender must be accompanied by a marked cheque for 5 per cent of the amount of tender.

The lowest of any tender not necessarily accepted.

T. HARRY JONES,
City Engineer.

City Engineer's Office, Brantford, Ont.
June 29th, 1909.

26

Miscellaneous

REPRESENTATIVES WANTED—A United States firm manufacturing Steam Rollers, Road Locomotives and Road Making Machinery want Canadian representatives in Toronto, Montreal. Vancouver Winnipeg and other large cities. This is a splendid chance to get hold of a desirable and good-selling line. Box 784 CONTRACT RECORD, Toronto. 27

Business Chance

A United States Firm manufacturing Composition Capitals. Interior Plastic Relief, Composition Ornaments, etc., are open to appoint Canadian agents in Toronto, Montreal and other large cities. A liberal arrangement will be made with a desirable firm. Box 785 CONTRACT RECORD, Toronto. 27

Business Buildings and Industrial Plants

Bracebridge, Ont.

The flour mills here, owned by Press & Son, valued at about $8,000, were destroyed by fire last week.

Chatham, Ont.

It is stated that the town is negotiating with a paper manufacturing concern with a view to the establishment of a factory.

Campbellford, Ont.

The ratepayers have approved a by-law to give the Northumberland Pulp Cmopany a fixed assessment of $3,000 for ten years on a pulp mill to be erected at a cost of $10,000.

Calgary, Alta.

The Western Milling Company will rebuild their elevator destroyed by fire a few months ago. The estimated cost of the new building is $12,000. A flour warehouse will also be erected at a cost of $4,500.

Charlottetown, P.E.I.

Tenders for construction of a 20-stall brick and concrete engine house and other buildings for the P. E. I. Railway will be received until July 12th by M. J. Butler, Chairman, Government Railways Managing Board, Ottawa.

Edmonton, Alta.

The Union Bank has purchased a site on Jasper Avenue for a modern office building.

Fort Frances, Ont.

It is stated that the Rainy Lake Lumber Company will commence this fall the erection of a large sawmill with a capacity of 100,000,000 feet per annum.

Fort William, Ont.

The contract for the Black, Muirhead Company's elevator has been awarded to Barnett, McQueen & Company.

Fredericton, N.B.

Frederick Harcourt, managing director of the Loose Leaf Ledger Company, has opened up negotiations with the Board of Trade with a view to establishing a factory in this city.

Montreal, Que.

The "Prince" building and adjoining property on St. Catharines street has been purchased by Friedman Bros., who will build an up-to-date planing factory and stores.

North Vancouver, B.C.

Providing satisfactory arrangements can be made with the city council the McDougall-Jenkins Engineering Company, Limited, will establish boiler shops, machine shops, and an iron foundry to handle both marine and stationary work, on the North Shore of the Inlet. The company stipulates that it be exempt from taxation, and be given free water for a period of ten years.

Ottawa, Ont.

The business block at the southeast corner of Bank and Lisgar streets, owned by T. Stanley, was damaged by fire last week to the extent of $3,000.

Regina, Sask.

A modern business block is to be erected in this city by M. A. Bowerman.

Sydney, N.S.

The Vidal hotel was practically destroyed by fire last week.

Stoughton, Sask.

It is stated that two more elevators will be erected here this season.

Saskatoon, Sask.

The Western Elevator Company have decided to build a system of elevators extending east and west of the town.

Toronto, Ont.

Sir Henry Pellatt has purchased a site at 86 and 88 Melinda street where he will erect an office building for his own use.

Vancouver, B.C.

J. C. and A. J. MacDonald, proprietors of the Grand Forks Machine & Structural Iron Works, are contemplating the establishment of large iron works in this city.

The Spencer departmental store was damaged by fire last week. Total estimated loss, $10,000.

The Imperial Rice Mill Company have been granted a permit for the erection of a three-storey warehouse and factory on Railway street to cost $17,500.

Windsor, Ont.

The Postum Cereal Company will immediately begin the erection of a $10,000 plant here. It is expected that it will be in operation by the beginning of November.

Winnipeg, Man.

The T. Eaton Company will build a $5,000 shipping shed on Donald street.

Yorkton, Sask.

Tenders for the erection of a concrete and brick business block at this town for the Enterprise Publishing Company, Limited, will be received until July 12th by T. A. Patrick, M.D. Plans at office of J. H. Russell, architect, Winnipeg.

Power Plants, Electricity and Telephones

Berlin, Ont.

The ratepayers have approved a bylaw to raise $19,000 for double tracking a section of the street railway track between Berlin and Waterloo.

Brockville, Ont.

Mr. Conroy, of Aylmer, Que., representing a power development company, recently waited on the Board of Light Commissioners with a proposition to transmit electric energy to Brockville. He stated that his company were prepared to develop on the Gatineau river 50,000 horse power, 20,000 of which would be delivered on the transmission line which it was proposed to build to Brockville. The matter is in abeyance.

Hensall, Ont.

Tenders are asked for the construction of a telephone system in Tuckersmith Township consisting of 100 miles of line and 230 telephones. For further information address A. G. Smilie, clerk.

Moose Jaw, Sask.

Tenders are invited by the city for electrical appliances, supplies, etc. (See advertisement.)

Moncton, N.B.

At a recent meeting of the Water and Light Committee tenders were opened for generator, engine and boiler for electric light works and referred to City Engineer Edington for report at a later meeting. The tenders were as follows: Babcock, Wilcox Company, Limited, for water tube boiler, $2330. Robb Engineering Company, for return tubular boiler, 125 h.p., $1040; Robb Mumford boiler, 150 h.p., $2100. Robb Engineering Company, for Robb Armstrong Corliss engine, $5448; for compound engine, 450 h.p., $6522. Canada Foundry Company, for return tubular boiler, $1495; for Standard boiler, $1185; for water tube boiler, $2,015. John McDougall Caledonia Iron Works Company, Limited, for 165 h.p. return tubular boiler, $1,190; for water tube boiler, $1,817; from same firm for generator, $6,000. E. Leonard & Sons, London, Ont., simple Corliss engine, $3,375; compound Corliss engine, f.o.b. cars, Moncton, $5,950; from same firm for return tubular boiler, $1,063. Canadian General Electric Company, for generator, $6,745; for engine and generator, $13,110; for engine and boiler and generator, $16,120; the same firm offered to instal plant with Robb engine for $13,272; with Cross compound engine, $14,325. Canadian Westinghouse, for generator, $7,395. I Matheson & Company, New Glasgow, for return tubular boiler, $1,100, with dome; $1,050 without dome. Laurie & Lamb, compound engine and generator, $10,500. Golding & McCullough, Galt, Ont., for Corliss simple engine, $5,289; Corliss compound engine, $8,352; for boilers, return tubular, $1,055; water tube boiler, $3,218.

Montreal, Que.
The Saraguay Electric & Water Company has submitted a proposition to the city council offering to supply electricity in four city wards, and also agreeing to make a start on the municipal electric light plant at advantageous terms. The company is willing to furnish electricity for lighting the whole city if sufficient time is given them to make preparations. The company offers to furnish the city with electrical service until the city is ready to install a municipal electric plant without further cost other than the annual cost of the lamps, the city to purchase the lamps when installed in the streets at their actual value, and also offers the use of its poles in case it decides to take over the street lighting system, the price for same to be fixed by the Public Utility Commission. The company will be prepared to furnish electricity to Duvernay, St. Jean Baptiste, St. Louis and Lafontaine wards within three or four months.

Niagara Falls, Ont.
The managers of the municipal electric light plant are making a test of a 25-cycle arc lamp and should it prove satisfactory it is said that the entire system will be changed.

Ottawa, Ont.
It is reported that options are being taken on water powers about the city of Ottawa to be utilized to generate electricity for the proposed Morrisburg & Ottawa Railway. Under the present plans it is proposed to transmit electricity to Ottawa where it will be used to operate the railway from Ottawa to Morrisburg; also for lamps and motors to villages along the route.

Regina, Sask.
The ratepayers have voted in favor of the proposition to issue $78,000 in bonds, the proceeds to be used for the construction of a municipal electric light plant.

Strathcona, Alta.
The ratepayers will vote on July 7th on a bylaw to provide for borrowing $15,495 on extensions to the electric light and power plant.

Vancouver, B.C.
The proposed extensions to the British Columbia Electric Railway were approved at a recent meeting of the Works Board.

Winnipeg, Man.
Tenders for grading spur line of the tramway of the city leading into their power house will be received until July 3rd by M. Peterson, Secretary, Board of Control.

AWARDED.

Campbellford, Ont.
The Seymour Power and Electric Company are installing a pair of direct connected motor-driven centrifugal pumps, pumps, built by the Smart Turner Machine Company, Limited, of Hamilton, Ont.

D'Israeli, Que.
The St. Francis Hydraulic Company, of D'Israeli, Que., have placed an order with the Canadian General Electric Company for three 300 horse power Canada water tube boilers, together with one 1000 k.w. 2,300 volt, 3-phase 60-cycle turbine driven generator.

Wellandport, Ont.
H. Lloyd, of Dunnville, has been awarded the contract for the construction of the first ten miles of the Dunnville, Wellandport & Beamsville Electric Railway. The railway will be about 23 miles in length, and will connect Dunnville, Wellandport and Beamsville. Jas. A. Ross, Wellandport, President.

Winnipeg, Man.
The contract for supplying and installing the electric lighting fixtures in the Fort Garry deport has been awarded to the Robert Mitchell Company, Limited, of Montreal and Winnipeg. It covers all chandeliers and lights, exclusive of the wiring, which is covered by a separate contract, and involves a sum in the neighborhood of $30,000.

Miscellaneous

Picton, Ont.
Tenders addressed to D. L. Bongard, County Treasurer, will be received until July 14th for the issue of debentures amounting to $30,000, issued for good roods construction.

Stellerton, N.S.
Tenders are wanted for $12,000 four and one-half per cent 30-year water debentures. Address J. W. Henderson, Town Clerk and Treasurer.

Toronto, Ont.
The City Engineer, the Assessment Commissioner, and the Commissioner of Industries held a conference last week to consider the plans for the reclamation of Ashbridge's marsh. A plan was adopted which is a combination of the plan made six years ago by the City Engineer and the plant recently prepared by Mr. J. G. Sing, the Government engineer. It provides for the immediate filling of 170 acres, exclusive of streets and lanes, at the west end of the marsh, for a ship channel 400 feet wide, and a number of slips at the west end of the reclaimed land, fronting on the harbor. The plan will be submitted to the special committee, of which Controller Harrison is chairman.

Recent building permits include: A. Paquette, 2-sty. brick dwelling, Foxbar road, $5,000; W. B. Charlton, pr. semi-det. 2½ sty. brick dwellings, Montague, $5,500; M. M. George, alterations to apartments, Avenue road, $6,000; Mrs. H. C. Hammond, 2½-sty. brick dwelling, St. George street, $19,475; Samuel Frame, pr. semi-det. 2-sty. and attic brick dwellings, Beatrice, $5,000; John Taylor & Co., 6 det. 2-sty. roughcast dwellings, Logan avenue, $4,500; J. Taylor & Co., 3 prs. semi-det. 2-sty. brick veneer dwellings, Morse street, $6,000; W. G. Burns, 2-sty. and attic brick dwelling, Keele street, $5,000; Expanded Metal Co., 1-sty, concrete and metal factory, Fraser avenue, $10,000; T. Gibson (in trust), alterations to warehouse, Wellington street W., $6,500; J. Curry, alterations to apartments, corner Church and Charles streets, $6,000; S. A. Armstrong, 2-sty. and attic brick dwelling, Russell Hill Drive, $5,000; J. S. Case, 2 det. 2½-sty. brick dwellings, Howard Park avenue, $8,000; R. T. Robinson, 2½-sty. brick dwelling, 64 Forest Hill road, $6,000; J. Singer, 4 att. 2-sty. brick stores and dwellings, corner Givens and College, $15,000; J. Taylor & Co., 3 prs. semi-detached 2-sty. brick veneer dwellings, Logan avenue, $6,000; Love Bros., Limited, 3 det. 2½-sty. brick dwellings, Fairview avenue, $9,000; W. P. Campbell, pr. semi-det. 2-sty. R. C. dwellings, brick fronts, Withrow avenue, $3,000; W. H. Martin (in trust), 3 att. 3-sty. brick stores and dwellings, and three 2-sty. brick stables, corner of Queen and Hambly, $14,000; J. Taylor & Co., 3 att. 2-sty. brick veneer dwellings, Eastern avenue, $3,900; Lewis Legrow, 2-sty. brick store and dwelling, and 2-sty. brick dwelling and stable, Lansdowne, $5,000; J. A. McKenzie, pr. semi-det. 2-sty. brick dwellings, St. Clarens avenue, $3,400; D. Cameron, 2½-sty. brick dwelling, Main, $3,600; J. W. Brown, pr. semi-det. 2-sty. brick dwellings, Christie, $4,000; A. Thompson, pr. semi-det. 2-sty. brick dwellings, Uziel, $4,000; McLaren & Bird, pr. semi-det. 2½-sty. brick dwellings, Radford, $5,000; W. W. Hiltz, 2 pr. semi-det. 2½-sty. brick dwellings, Dingwall, $9,000; Chas. A. Grant, 5 att. 2 sty. R. C. dwellings, brick fronts, Wardell, $6,500; A. T. Mackie, 2½-sty. brick dwelling, Avenue road, $14,000; Mrs. Grafton, 2 det. 2-sty. brick dwellings, Margueretta street, $5,000; A. Smith, 3 att. 2-sty. R. C. dwellings, Emerson avenue, $4,500; George Griffin, 2½-sty. brick dwelling, St. Vincent street, $3,000; Dominion Bank, alterations to bank, corner Queen and Dundas, $3,500; Chas. Winyard, 2½-sty. brick dwelling and stable, Dunvegan road, $5,000; Wm. Stollery, 2½-sty. brick dwelling, Sidney, $4,000; Jos. Cleal, 2-sty. brick factory, Mac Donnell, $8,000; Mitchell & Bennett, 2-sty. and attic brick dwelling, Sunnyside, $4,000.

Vancouver, B.C.
It is understood that the railways will submit to the council a definite proposal in regard to the improvement of the basin at the head of False Creek.

Recent building permits include: Dr. Richardson, Bidwell street, $5,000; R. Mills, 2522 Ontario street, $2,500; R. Mills, 1244 Seventh avenue, $2,500; C. Wing, 1118 and 1122 Rose street, two houses, $2,500; Beard & Copeland, 1871 Ninth avenue, $2,500; M. S. Logan, 2530 Victoria street, $9,000; J. Stamsby, 824 Victoria drive, $2,000; M. A. McLeod, 2242 Sixth avenue, $2,000; M. Blygh, First avenue west, $2,000; J. Balmer, 2490 First avenue west, $7,000; J. E. Guinet, 930 McLean drive, four houses, $7,200; J. E. Braithwaite, 2223 Eighth avenue west, $2,400; J. E. Braithwaite, six houses, Yew street, $7,800, and three houses in 2200 block, Yew street, $3,900; T. Crawford, 1503 Fifteenth avenue east, two houses, $3,000; W. M. Meredith, 2632 Alberta street, $4,000; Walworth Rolston Company, Great Northern Reserve, $3,000; A. McVicar, 2162 Sixth avenue west, two houses, $3,600.

AWARDED.

Cobalt, Ont.
The Kerr Engine Company, Limited, of Walkerville, Ont., are supplying the iron body gate valves for the Cobalt Hydraulic Power Company, of Cobalt. The Kerr Company report an unusually busy season on valve and hydrant work.

Westmount, Que.
The council have awarded the following contracts: Babcock & Wilcox, 200 horsepower boiler, $4,590; Bishop Construction Company, incinerator boiler house extension, $9,313.

Frank Goodwin, tinsmith and plumber, Sarnia, Ont., has assigned to E. W. West.

Louis Blouin, plumber and tinsmith, Quebec, Que., is reported to have assigned.

E. Gingras & Company, contractors, Montreal, Que., have dissolved partnership.

Kent & Parr, Strathcona, Alta., dealers in electrical supplies, have dissolved partnership.

William Lowe, brickmaker, Oshawa, Ont., is reported to have assigned to J. F. Grierson. Creditors met 25th inst.

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Protection of the Municipal Engineer

Town and city engineers not infrequently have to suffer because of the proper performance of those duties which are a part and parcel of their position. Primarily, the trouble is due to their having to do certain things which are resented by individual members of the community, who, owing to a fancied grievance, seek to be revenged upon the official. Such a line of conduct is worse than the worst official harshness. The so-called "harshness" of the official generally emanates from a zeal which is not only desirable but essential. The efforts of the citizen to imperil the official's position because of a little "harshness' of this kind proceed from some of the worst motives that lead to the perpetration of wrong.

Canadian municipal engineers have hitherto enjoyed a fair amount of immunity from troubles of this kind. Nevertheless, it would not be a very far call to towns and cities whose engineers have been compelled to put in their resignation owing to the spite of some aggrieved citizen who was fortunate or unfortunate enough to have friends in power. If the profession of municipal engineering is to be raised in status and improved in definition, this evil will have to be entirely abolished. It is only fair that if the legislature imposes certain obligations in connection with the position it should protect those holding the office.

In its relation to the community at large and to the individual citizen, no profession is of greater importance than that of municipal engineering. Whether this is fully enough realized in Canada at the present time is doubtful, but it will require little reflection on the part of any one conversant with the subject to see that this is so. The legislators should be brought to a better appreciation of this and should be persuaded to give every assistance in the up-building and strengthening of the profession and to afford protection to the members thereof.

Surely it is not desired to have municipal engineering a kind of resource, something with which to pave the way for a consulting practice or for commercial undertakings! Then every effort must be made to make the lot of the town and city engineer additionally attractive and secure. Under the best conditions the position is not a bed of roses. The remuneration as a rule is not of the kind to make a man's eyes bulge. And yet how much is expected! The responsibilities are exceeded in their importance only by their number. Those in authority, and in fancied authority, are many, and often very ignorant. The knowledge and experience expected of the engineer approaches the infinite. And for what? For the tenure of a position which under present conditions has the most decided limitations both in regard to salary and individual distinction.

The most disagreeable consideration, however, is that of the possibility of having to pay, directly or indirectly, a penalty for doing a duty that is obligatory. There are those whose whole lives have been spent and will be spent in municipal engineering. To these particularly these considerations should appeal, for it is more directly in the interests of such to support any measures that are adopted with a view to elevating and strengthening the profession.

The True Problem of Architecture

The true problem of architecture is to express the uses of a building in terms of beauty; and an original architecture is likely to rise only when the architect cannot get away from this problem, when use dictates his design and his employers will not be content with it unless he makes it beautiful. Now in a great many of our modern town buildings the design is dictated by use. The architect of shops and flats and hotels must make them fit for their purpose. His employers will not subordinate their conveniences to his abstract ideas of style. Therefore one of the conditions of originality already exists for him. But that condition by itself will produce nothing but mere ugliness. There must also be the desire for beauty in the public. This desire may have very unfortunate results, but the ugliness produced by it is different in character from that produced by mere indifference, and incomparably more hopeful.

With a view to encouraging the interchange of ideas upon practical building topics and to supplement the contributions obtained through the usual channels, we invite our readers to supply us with original articles coming legitimately within the scope of the "Contract Record." All MSS. and drawings submitted will be carefully considered and those used paid for. Preference will be given to descriptive articles illustrative of special constructional features and methods employed.

Leading Canadian Contractors

The Carter-Halls-Aldinger Company, Winnipeg

The name of the Western metropolis is identical with rapid advancement and progressiveness. Winnipeg is a synonym also for youthful enterprise. The West seems to be essentially a young man's country. This fact is borne in upon one with peculiar force when one considers who are behind the phenomenal upbuilding and development of the West. A bright example of a young firm's success is furnished by the Carter-Halls-Aldinger Company, Limited, general contractors, Winnipeg, Man., a concern which is doing great work in the West and which has won its way into the foremost ranks in the Canadian contracting field. There are few firms in the whole of Canada which have at their head such a young, yet experienced, combination.

Mr. W. H. Carter, President of the Carter-Halls-Aldinger Co., Limited, and President of the Winnipeg Builders' Exchange.

Mr. Frank E. Halls, of the Carter-Halls-Aldinger Co., Limited, General Contractors, Winnipeg.

Mr. A. H. Aldinger, of the Carter-Halls-Aldinger Co., Limited, General Contractors, Winnipeg.

The president, Mr. W. H. Carter, who is also president of the Winnipeg Builders' Exchange, has charge of all general work. Mr. Halls has charge of the office executive, whilst Mr. A. H. Aldinger is the chief engineer in charge of the drafting and engineering departments. Each one at the head of a perfect system contributes to a combination that is hard to beat.

The Carter-Halls-Aldinger Company, Limited, have in hand at the present time over one million dollars' worth of contracts, including the following: Calgary dam, $175,000; C.P.R. bridge at Treesbank, $35,000; McArthur building, Winniueg, $450,000; Dominion Bank, Fort William, $35,000; Dominion Bridge Company's works, $25,000; McMillan & Vollans block, Winnipeg, $110,000; W. A. Machaffie's residence, $12,000; hotel at Nepigon, $25,000; International Harvester Company's warehouse at Saskatoon, $75,000, and other contracts, $59,000, making a total of about one million dollars. They have just completed the Cuthbertson block, $115,000, and the Syndicate block, $25,000, both at Fort William. Mr. W. A. McCormick is the manager of the Carter-Halls-Aldinger branch office at Fort William, Ont.

The McArthur skyscraper which this firm is now building will be twelve storeys in height, and 150 men are at work on its construction. The roof of the building will be 165 feet above the street. Two million bricks will be involved in its construction, and many thousands of tons of steel and stone. The Carter-Halls-Aldinger Company will be solely responsible for the erection of the building.

It is on the McArthur building that the most up-to-date methods for excavating have ben used. An immense hoisting derrick picks up a heavy four-wheel waggon and places it in the pit, where it is rapidly filled. Two large chains catch the waggon in front and rear. When it is filled the derrick raises the loaded waggon and places it lightly upon the roadway, where a team is then hitched to draw it away.

A bungalow to cast $30,000 is being erected at Argyle, N.S., by a Bostonian named Mr. Cox. Mr. Cox represents a number of families, who propose making Argyle their summer resort. They have bought a tract of some 200 acres of land and propose fitting the whole up in modern style. Some idea of the bungalow may be gleaned from the fact that there are to be seven bathrooms and ten lavatories in the building. Work will be commenced at an early date. When completed and occupied it will form quite a community, there being about seven families interested.

Brown Bros. & Company, architects, Cedar Rapids, Iowa, have issued an attractively bound and illustrated publication, entitled, "The Bungalow Book." This work is devoted almost entirely to the architecture of bungalows and rural villas. The buildings illustrated are exclusively the design of the publishers.

Practical Pointers on Bricks and Brickwork

A Consideration of the Most Common Defects Encountered in Manufacture and Workmanship — By Alfred Searle

When bricks were all made by hand the bricklayer's chief concern was to obtain bricks of a sufficiently accurate shape so that the joints would be of even thickness and the general appearance of the work satisfactory, writes Alfred Searls, in the "National Builder." With hand-made bricks the nature of the clay used and the temperature at which it is fired are both in favor of the bricklayer, and the only source of trouble is the irregular shape and size of some of the bicks, especially when clamp-burnt bricks are used. Consequently, most hand-made bricks will lay well, providing that they are sorted with reasonable care, the badly shaped bricks being reserved for filling up or backing.

With the increasing difficulty in obtaining skilled men as moulders, which has been experienced during the last few years, and with the enormous demand for cheap bricks in large quantities, which has been so characteristic of the last two decades, it was only natural that use should be made of machinery to supplement the output, and for a long time past the machine-made brick has increased in popularity and usefulness, until it is the chief product of most of the brickworks in the country, hand-made bricks being confined to small yards and sparsely populated localities, with a few notable exceptions.

Fortunately or otherwise, the application of machinery has resulted in the production of a brick of entirely different qualities from those possessed by bricks made by hand, and while the newer styles of bricks can be made more accurate in shape, and often more even in color, many bricklayers find that when in use the structure is not as strong as it should be. In other words, the bricks do not "lay" well.

The causes of this trouble are of three main types—those connected with the absorptive power of the bricks. those allied to the burning of the bricks, and irregularities in composition due to the less thorough or insufficient treatment accorded to the clay. Of these the first is by far the most important, as it is on the power of adhesion between the mortar and the brick that the strength of the brickwork depends.

Porous Bricks.

For most purposes bricks should absorb at least one-sixth of their weight in water, and many bricks will absorb as much as one-fifth or even one-quarter of their weight, but these must be regarded as more porous than is either necessary or desirable. A very high porosity or water-absorbing power implies that a brick has not been fully burnt, though too much stress must not be laid upon this statement, as certain sandy clays will not make dense and non-porous bricks. The higher the temperature reached in the kiln the greater the probability of dense, strong, but non-porous bricks being produced. This high temperature is all to the good up to a certain point, but beyond this the bricks will soften and twist or warp, or in other ways lose their shape, and their color will be changed. Even when heated to a temperature just below the softening point, whereby the bricks attain their maximum strength, it may happen that the color produced is considered undesirable by the customers, and the lack of porosity may prejudice the bricklayers against the use of a brick which is in many ways superior in durability and strength to others from the same clay fired at a lower temperature.

The brickmaker must therefore effect a compromise according to the class of trade for which he caters; he may aim at producing a hard and dense brick suitable for engineering purposes on account of its great strength, or he may prefer to manufacture a stock brick of less strength but more easily laid, and of a very pleasing color. It is only in exceptional cases that a brick can combine the characteristics of both these classes.

Many bricks made from a shale or easily vitrified clay will produce work of great strength, providing the bricklayers understand their work properly, but these bricks are usually vitrified at the surface —though porous enough in the centre), and unless the mortar used partakes more of the nature of a cement than an ordinary mortar, the adhesion will not be so great as could be wished. Certain well-known bricks are of a peculiar nature in this respect, as owing partly to the method of manufacture employed and partly to the material from which they are made, it is difficult to get mortar to adhere properly to them unless they are "keyed" in some way. All bricks of low porosity are subject to the same disadvantage from the bricklayer's standpoint, but their greater strength more than compensates for this when the bricks are employed for engineering purposes.

Vitrified Bricks.

There is an increasing tendency to favor the use of partially vitrified bricks, and in an important book for architects recently published, it is definitely stated that no brick should absorb more than one-tenth of its weight of water, i.e., it should only be half as porous as the average brick made fifteen years ago. While much may be said in favor of this low porosity, it is not likely to increase the popularity of bricks with the men who have to lay them.

In testing the porosity of a brick, it is important to decide whether a whole brick or a broken one should be tested, as the two will not yield the same results in all cases, particularly if the bricks are vitrified near the surface, but are more porous internally.

Bricks which are uneven in composition will not lay well on account of the great variations in color, and if improperly burned it will often be found troublesome to use bricks which are broken into two pieces so as to provide a proper bond. These characteristics are, however, all easily observable to the ordinary bricklayer, and are less likely to cause trouble some time after the masonry has been completed than are bricks to which mortar does not easily adhere.

It must not be forgotten that many bricks are said to lay badly when it is really the fault of the mason and not of the brickmaker. Thus a wall may prove to be weak because the mason has not taken sufficient care in slushing the joint with mortar, in keeping the bricks down to a tight joint, or to the mortar, not being spread evenly over the top of the lower course. It is not uncommon in erecting cheap houses to find that the bricklayers place a "dab" of mortar at each end of the brick. and so leave a hollow space in the centre. which is a source of weakness instead of strength to the structure. When this is done with "butter' joints, the weight of the wall may be sufficient to cause the bricks in the lower courses to spall. This may be entirely avoided by taking care that the centre of the bed is properly supplied with mortar.

A Faulty Bond.

Bricks are sometimes blamed for weakness when the real evil is a faulty bond, for one of the chief sources of strength in a wall is the headers used in its construction. In fact, no high wall can be built securely unless an ample supply of headers is provided; it would collapse. In any case, it is essential that no wall should be built unless there is a header course or its equivalent in at least every five courses, and it is better to have every third course constructed of headers. It is not, of course, necessary that these headers should be seen from the face of the wall, and, if desired, a "secret bond" can be employed.

Another case of difficulty in laying bricks is due to the architect overlooking the fact that a thoroughly sound bond can only be made if the various parts of the building are made to brick dimensions. If this is not the case, the bricks must be cut or rubbed to fit, and this is both time-consuming and costly. On this account also bricks should, as far as possible, be made to certain well-defined sizes, and notable variations from these "standard sizes" should be rejected except for special work. This is most necessary when hand pressed bricks are used. Bricks of unusual size or shape are always more costly, though if used alone or in connection with work into which they bond properly, no special difficulty need be experienced in the laying.

In short, some bricks are difficult to lay because of the defects in their manufacture—they are out of shape. or too close in texture—while with others the fault is with the bricklayer himself, or with the architect.

Is Diagonal Sheathing Better Than Horizontal?

A Discussion which Tends to Indicate a Popular Fallacy in This Regard—By Dwight L. Stoddard

We often hear it said that to sheathe a house horizontally makes a poor job, while to put the same lumber on diagonally makes a first-class job; that it is no wonder the balloon frames are being brought into discredit —allowing so much rapid work of horizontal sheathing, etc.

Now, I am not condemning diagonal sheathing, never did and never expect to, for if it is well done it makes a good job, and in some respects is much better than it would have been if put on horizontally.

Some put it on diagonally at each corner until they come to an opening, and then put the rest on horizontally, as in fig. 1. Some claim that makes a good job, while others claim it makes a very poor one. Now, if bracing the house is what they want, I will admit that this arrangement does it, to some extent at least, though unless the joint is reinforced with a two by four—which I am sorry to say is not often done—it makes a weak and bad job where the diagonal and horizontal work come together.

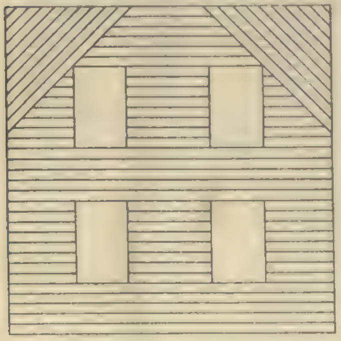


Fig. 1.—Horizontal Sheathing Diagonal Corners.

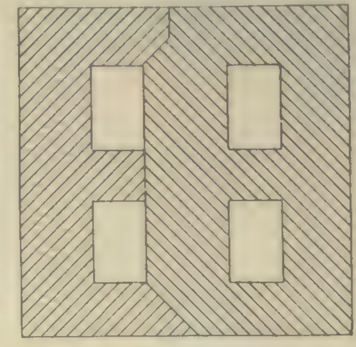


Fig. 2.—Suggestions for Diagonal Sheathing.

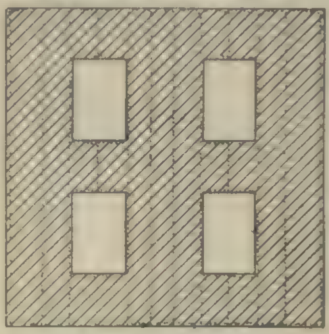


Fig. 3. Diagonal Sheating Nailed.

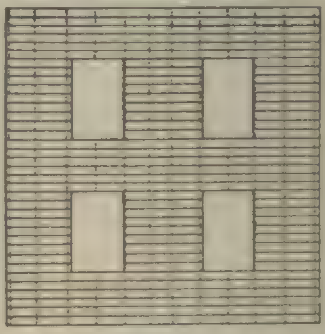


Fig. 4.—Horizontal Sheating Nailed.

The real way, as I understand it, is to make both corners braced and then come together in the middle the best you can, similar to the way I have illustrated, fig. 2. And yet some might truthfully say that is somewhat of a poor job, as it looks quite weak in the centre. I am afraid if anyone should put down a diagonal floor like that he would be called a very poor mechanic indeed. Yet who ever saw one put on diagonal sheathing starting at one bottom corner and going clear across the side of the house and finishing at the top of the opposite corner, as illustrated in fig. 3? But unless we put it on that way we cannot make a very good job of it. Yet, after all, are this or any of these styles really much better than the horizontal? Let's stop and consider a few minutes. We say the diagonal is much the stoutest and strongest; will stand more strain than horizontal work; but if so, why is it that we don't build all heavy boxes that way? They have to be knocked around and carry heavy material from one end of the country to the other. Surely they should be built as strong as possible. Yet if you would investigate you would find, I think, a very small number of them that are built diagonally.

Now, isn't it a fact that, while the first board put up diagonally forms a brace, after all, if the whole house is nailed together, it matters not which way or how, it becomes strong, depending mainly on the number of nails that you have put in securely. You will notice, if you will go to the bother of comparing the nails in figs. 3 and 4, that the diagonal has about fifty nails to each studding, while the horizontal has over seventy. So you see you generally drive more nails and therefore in a way make the horizontal job the best. Again, you are in a better position to do good work, and generally get the work driven closer together when you put it on horizontally; while often, putting it on in a hurry diagonally, you are liable to leave the top end to nail later, and by the time you get to it there are some such big cracks that even if it is diagonal it looks very bad. No, I do not believe there is as much more strength in the diagonal as many would try to make one believe. In fact, in my whole life as a builder and observer, although I have seen the work of many severe storms, I have never yet seen a house blown down because it was horizontally sheathed.

The only advantage I have ever been able to find in diagonal sheathing is in case of wet lumber that will shrink a great deal, or even in poor lumber that is not all exactly of a thickness. With this the siding goes on over the diagonal and makes a better job. Where the siding is put on before the sheathing has time to dry out and shrinks, as illustrated in fig. 6, it not only makes the siding show where it draws away from the paint, if the paint is put on as it often is in these days of rapidity before the shrinkage has taken place, but sometimes it even splits the siding from one end to the other. Of course, that is only in very rare cases, and when it happens it surely is a poor job indeed. In fact, any house that is sheathed with wet lumber, or even common sheathing, is a poor job any way you put it on. The little difference in the expense of making a good job by putting on dry matched lumber is so small that no one can afford to sheathe a house with common sheathing any way.

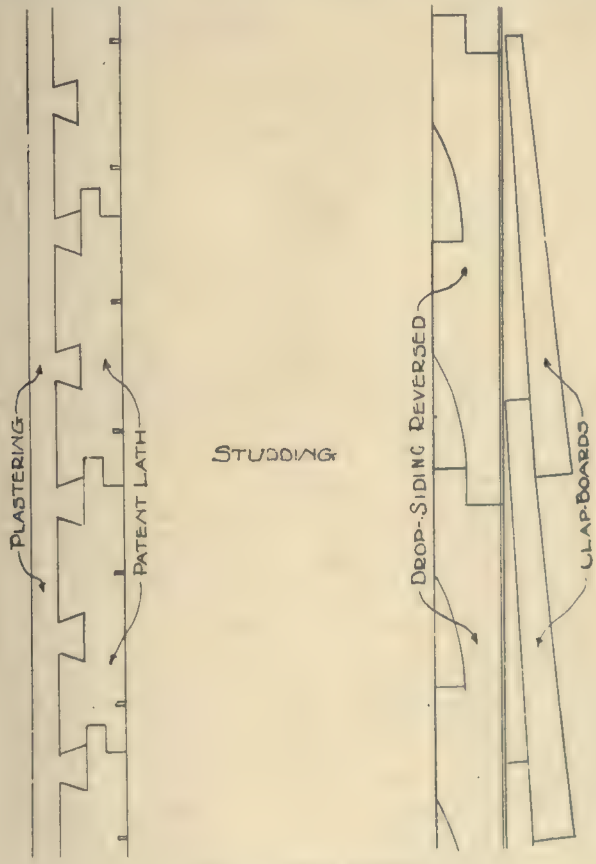


Fig. 5.—Wall Section.

Some would try to make you believe that horizontal sheathing is so poor that the house will hardly stand if built that way, yet if these same people were going to build and not put on any sheathing at all they would not expect you to put on the siding, be it bevelled or drop siding, diagonally. Common 6-inch flooring, or even 8-inch shiplap, makes a good lining for a house; and, if well put on, even horizontally, is a better job than common sheathing. I care not how it is put on.

When I built the house I am living in now, the yard where I got the lumber did not have any shiplap at the time, so they sent me drop siding. By putting it on inside out, putting on paper and then siding it on the outside, and with patent lath and good plaster on the inside, as shown in fig. 5, I made a good job of it. From without there is no way of knowing that the lining was put on horizontally, and it can not be told on the inside either, for the plaster stands there perfect—the walls are tinted and show the plastering perfectly; there is no white coat or paper to cover up the real plastering itself, which has stood there for years to prove that the horizontal lining was not so very bad after all. My own house, and many that I have built for others, show me that there are many other things that make a poor job of a house, far more than whether the sheathing is diagonal or horizontal.

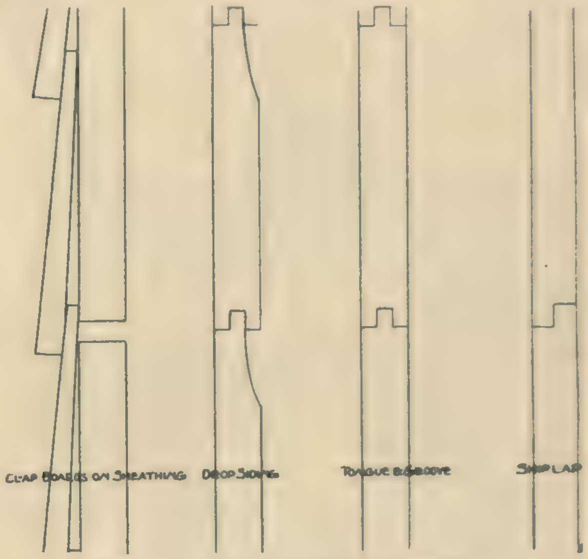


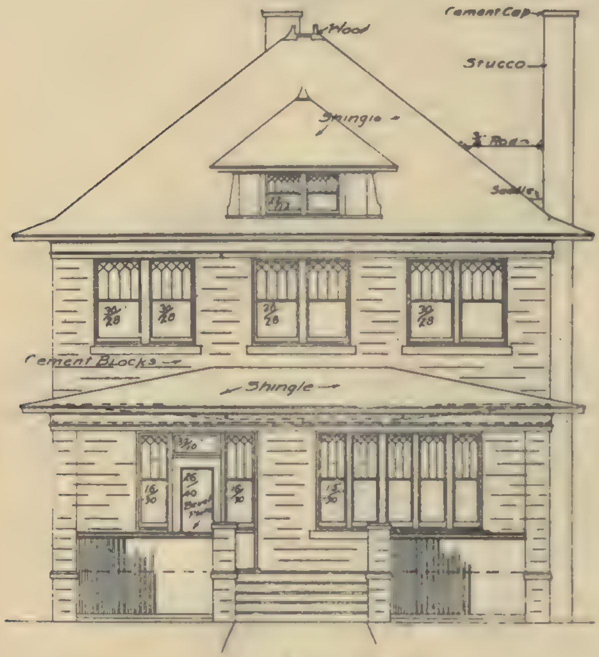
Fig. 6.—Common Types bf Siding.

The Retort Appropos

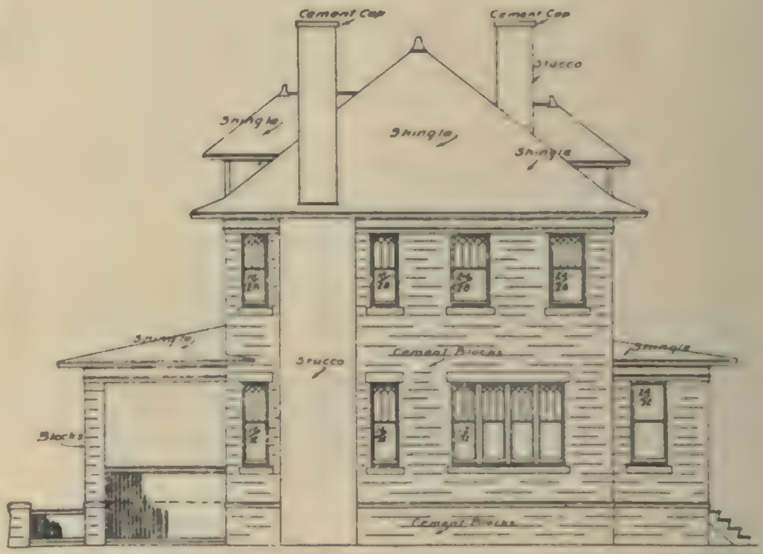
Whatever may be the moral effect of a soft answer, its use is not to be advocated irrespective of circumstances. There are times when a sharp retort is absolutely called for, and the man who has none ready loses a golden opportunity. The following tale is "going the rounds" in commercial circles. A firm of suppliers, which had been unable to do business with a building firm, received an extensive order accompanied by the following letter. "Dear Sir,—To-day we have given your Mr. X an order, thanks to his colossal impudence. Where did you find him?" Mr. X, it appears, had only just started on the road, and this was an order from a firm that his predecessors had canvassed in vain. His employers called him in and questioned him about the charge of "colossal impudence." "Well," the young traveller explained, "you told me to adapt myself to all manner of circumstances and to behave to possible customers in their own way. In this case the head didn't look up for three minutes after I went in, and then he said: 'Well, what blood-sucking firm do you represent?' I gave him my card and said, 'These rotten vampires,' and it seemed to tickle him."

The man who thinks to work through all his waking hours will some day be unable to work through any of them.

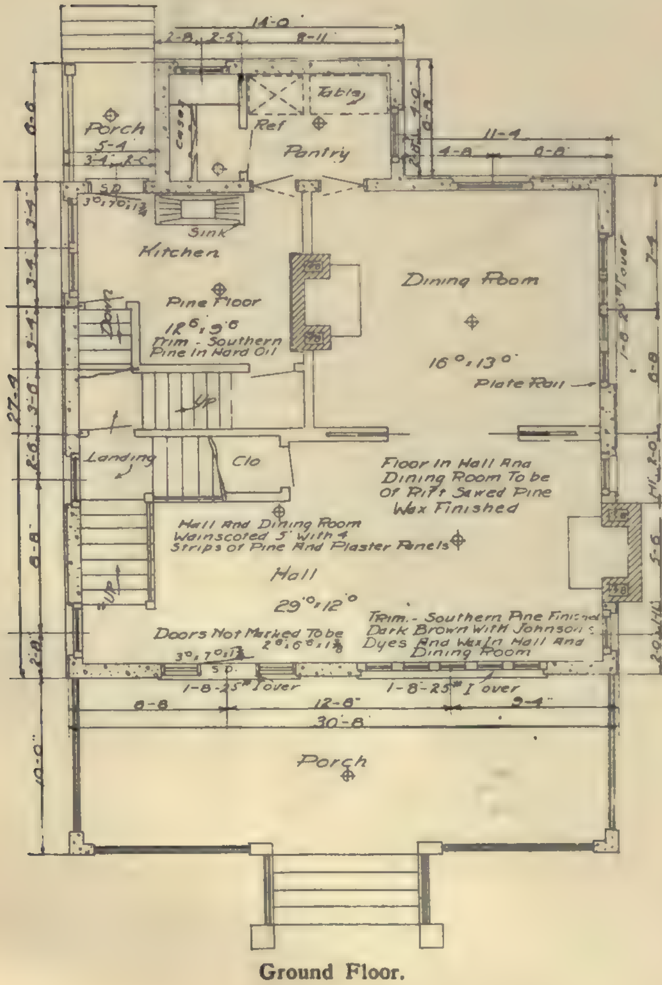
Attractive Design for a Concrete Block House



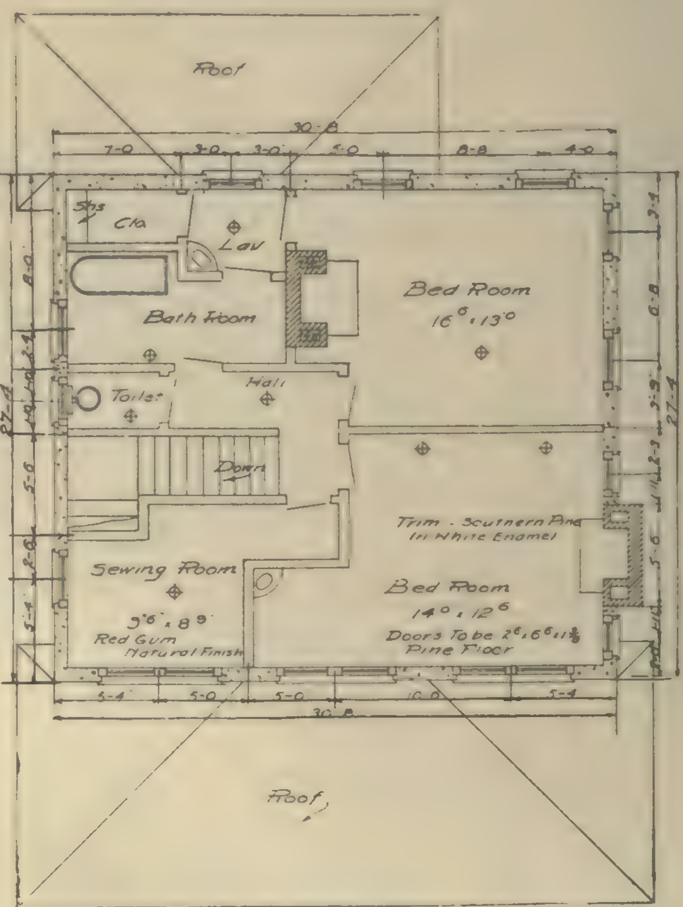
Front Elevation.



Side Elevation.


14-0
Porch
5-4
Case
Ref
Table
Pantry
Sink
Kitchen
Pine Floor
12⁶ x 9⁶
Trim - Southern Pine In Hard Oil
Dining Room
16⁰ x 13⁰
Plate Rail
Up
Landing
Clo
Floor In Hall And Dining Room To be Of Rift Sawed Pine Wax Finished
Hall And Dining Room Wainscoted 5' with 4 Strips of Pine And Plaster Panels
Hall
29⁰ x 12⁰
Up
Doors Not Marked To be 2⁸ x 6⁸ x 1⅜
Trim.- Southern Pine Finished Dark Brown With Johnson's Dyes And Wax In Hall And Dining Room
Porch
30-8
10-0

Ground Floor.



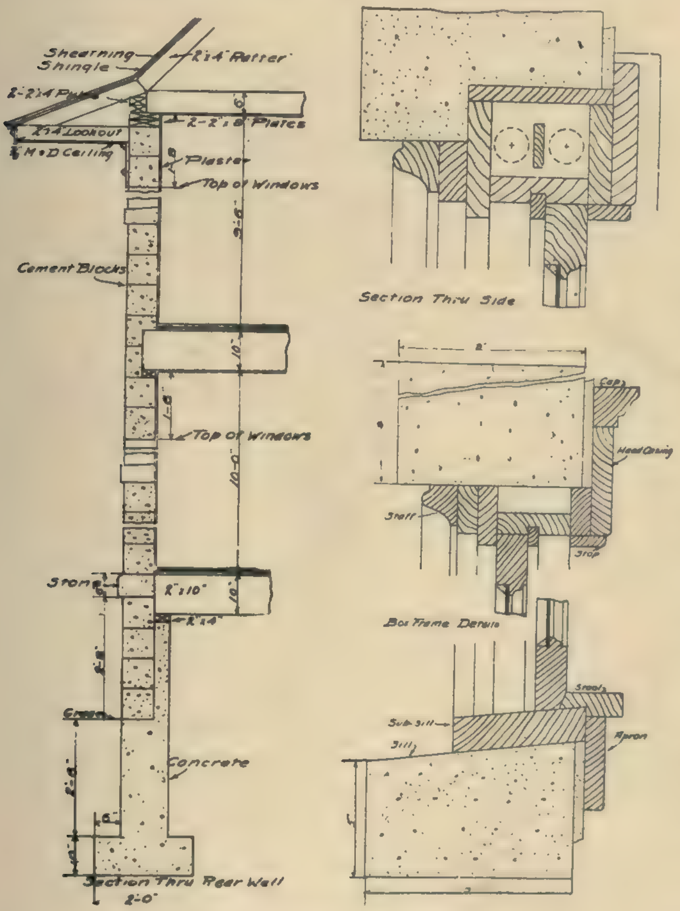
First Floor.

Details of Illustrations

The accompanying drawings illustrate plans which were made for a concrete block home, and are reproduced by courtesy of "Concrete." All the exterior wood work of the house is painted white, which, in contrast with the green stained shingles on the roof, and the natural gray of the concrete block, helps to make this a very attractive home. All the exterior and interior foundation walls and footings are of concrete, the outside walls are of concrete block, and the chimney caps, window and door sills, etc., are concrete.

A pleasing feature of this house is the front porch, which, having no central columns, permits a broad, unobstructed view. The porch roof is supported by a truss built in the soffit.

The house is arranged with plenty of windows to afford good light and ventilation. It will be noticed that no heating system is indicated, except the four fireplaces, two on the first floor and two on the second, but this is a deficiency which could easily be met by a practical builder. The fireplaces on the first floor are of pressed brick. The brick work extends to the ceiling, and has a wooden shelf at a height of about five feet from the floor. The concealed portions of the chimneys are of good, hard-burned common brick, and the exterior exposed portions are finished with stucco.



Constructional Features.

The interior arrangement of the rooms is very convenient, the entire width of the front being one large living room, 29 feet x 12 feet, with the fireplace at one end and an open stairway at the other. This room is separated from the dining room back of it by sliding doors and both rooms are trimmed in pine, stained and waxed. These two rooms are panelled to a height of five feet with 4-inch panel strips and rough plaster panels. The hall has a suitable wainscot cap on top of this panelling. The pantry has space for a table and a refrigerator and also has built-in cupboards and cases. The kitchen has a convenient rear stairway which connects with the landing of the front stairs to the second floor. Two bedrooms, a sewing room and a bathroom are arranged on the second floor. These rooms are trimmed in pine, and finished with white enamel.

It was not necessary to excavate under the entire house and arrangement has been made for cellar only, which is reached by a stairway from the kitchen. A hot water tank placed in the kitchen supplies hot water to the second-floor bath and lavatories, and to the kitchen sink. The house is wired for electric lights, and is modern and convenient throughout.

Trade Enquiries

The Dominion Government Trade and Commerce reports contain the following trade enquiries. Readers of the "Contract Record" may obtain the names of enquirers by writing us, enclosing stamped envelope and stating number of enquiry:

757. Closet seats.—A Manchester firm asks for prices of closet seats from Canadian manufacturers.

772. Wire rope.—A South African Government railway asks for catalogues, price lists, etc., from exporters of wire rope.

776. Iron pipes and piping.—A South African Government railway asks for catalogues, price lists, etc., from exporters of iron pipes and piping.

790. Iron founders.—A South Wales firm of engineers, hardware factors and motor accessories manufacturers, which is proposing to establish a factory at Toronto, wishes to hear from malleable iron founders in the vicinity of that city from whom supplies of castings could be obtained.

794. Agents.—A Scottish firm manufacturing steel wire and wire rope wishes to appoint agents in Canada.

801. Agency abroad.—A firm of engineers' merchants, well established in London and Newcastle-on-Tyne, and in the leading industrial centres of Great Britain, are open to consider a sole agency arrangement from Canadian manufacturers for the sale of mechanical appliances, engineering specialties, etc.

Recent excavations made on the site of old Babylon make it plain that the people in the days one or two thousand years before Moses, lived and did business very much as we do now, says a writer in "Shoppell's." Landlords built houses to rent, and moderate sized houses could be rented for from 75 cents to $3 per year and taxes. The $3 houses were very desirable ones, having eight rooms, a court yard and garden and commanding access to the grand old river. There were no old maids in Babylon. Every girl was supplied with a man. If she did not get one herself, the state provided one for her. Women had large privileges, too, in those days. It is on record that they could hold property independently of their husbands, and could exercise the rights of citizenship without let or hindrance. Provisions were cheap; chickens could be bought for about 2½ cents each, and a whole sheep did not cost more than from $1.25 to $1.50. A firm by the name of Egiby & Sons lent money at 20 per cent. Politics were as lively in Babylon as they are to-day in some cities nearer our homes. Broken heads and libel suits were as frequent then as now. As a whole it may be concluded that we are not, after all, much better off than were the old Babylonians.

Municipal Engineering and Construction

Waterworks, Sewerage Systems, Roadways, Bridges, Power Plants, Public Improvements Generally

Concrete in Waterworks Construction—Its Applications and Advantages

At the recent convention of the American Waterworks Association, held at Milwaukee, the advantages of concrete, both plain and reinforced, for the various parts of a waterworks system were pointed out by Mr. William C. Mabee, constructing engineer for the Indianapolis, Ind., Water Company.

Concrete, Mr. Mabee stated, has many advantages over other types of construction. It is easily and conveniently handled and transported, often at a less cost than stone masonry, and often suitable sand and gravel for the work in hand can be found on the site. With proper supervision, skilled labor is not essential in the usual work. Concrete has the additional advantage over stone of being readily moulded in intricate shapes.

To produce concrete surfaces of a satisfactory smoothness and uniformity it is necessary that the moulds be carefully and properly built, and also that the concrete be of the proper consistency to flow readily, and it is also necessary to thoroughly churn and keep it in motion in the moulds.

Concrete may be placed in moderately freezing weather if proper precautions are taken to warm the gravel or stone and sand, to heat the water and to cover the work until initial set takes place.

The problem of preventing cracks has worried engineers. It has become the practice to provide for these cracks by building short sections in alternate blocks; however, by the judicious introduction of steel bars, objectionable contraction cracks can be entirely eliminated.

The waterworks engineer or superintendent, Mr. Mabee believes, is particularly interested in the subject of waterproofing concrete. It has been shown that wet concrete is more dense and consequently more impervious than dry concrete and that concrete becomes more or less porous as the quantity of cement is increased or diminished. A smoothly trowelled surface produces a water-tight film or skin. It has also been found that slaked lime added to the concrete mixture helps to make it less permeable. The lime does not injure the cement in any way, although retarding the setting. Coal tar, pitch and asphalt mixtures applied on concrete are used with more or less success. A wash composed of 1 pound of lye, 5 pounds of alum and 2 gallons of water, applied with a brush and well rubbed in, has been used successfully on Government fortifications. A rich cement mortar plastered over concrete, Mr. Mabee believes, makes a very good waterproofing medium.

Permeability of Concrete Demonstrated by Official Tests

Regarding experiments made on large reinforced concrete pipes by the United States Geological Survey, and intended to discharge under pressures up to 35 pounds per square inch, Mr. Mabee states that they have demonstrated the permeability of concrete and the practical value of different kinds of plasters, paints and washes. It was found, he states, that all of the tests made on washes or paints gave comparatively poor results.

The conclusion drawn from these experiments was that the best results could be obtained by giving the inside of the pipe one coat of plaster ½-inch thick, composed of one part cement to one and one-half parts sand and a small quantity of lime paste thoroughly cooled to retard setting, keeping the pipe well wet ahead of the plastering, and when this coat, which is left rough, had dried, another coat, about ¼-inch thick, of plaster composed of one part cement to one part of sand. This coat should be trowelled to a smooth surface and when dry the entire inside surface of the pipe should be covered with a thick wash of cement and water. When the water pressures are not great and the concrete is sufficiently rich in cement, no plastering is necessary.

Concrete has found a wide field of usefulness in its application to waterworks, and it would be difficult to imagine a purification works built to-day in which concrete was not the principal building material. It is particularly adapted to the construction of water conduits and pipe lines, to tanks and basins, to water towers and standpipes, to reservoirs and clear wells and to filters, either slow or mechanical. Mr. Mabee then reviewed the progress of the application of concrete to filter construction, leading up to a description of the concrete structures of the works with which he is connected.

An Indianapolis Filter Plant.

The filter plant of the Indianapolis Water Company is supplied by a gravity flow from the Indiana State Central Canal, which was originally built by the State for transportation purposes and later was purchased by the company. The head gates and concrete sluiceways of the canal are located about 6½ miles above the intake to the filters. The canal is carried over Fall Creek in an open aqueduct at a height of 18 feet above said creek. On March 26, 1904, a flood carried away the existing aqueduct, which was built of wood, supported by steel trusses on rubble masonry piers and abutments. The bridge was rebuilt as a reinforced concrete structure 300 feet long and 41 feet wide, having four skew segmental arches, each of 60 foot span with a 10-foot rise from the springing line to the soffit, and a crown thickness of 18 inches. The height from the foundation courses to the towpath is 35 feet 9 inches. The foundations for the piers, abutments and wing walls were carried down 16 feet below low water and rested upon a bed of sand and gravel.

The arch ring is reinforced with 8-inch steel I-beams spaced 2½ feet on centres and bent to the curvature of the arch. Over the extrados of the main arches and in line with Fall Creek were built small transverse arches, the purpose of which was to increase the discharging capacity of the bridge during freshets and to eliminate the possibility of freezing, which might occur with hollow spandrels.

Over these smaller arches was placed the trunk or aqueduct proper; this was constructed of a 9-inch concrete slab reinforced with steel rods, extending into the side walls, which were 6 feet high and 2½ feet wide, with a projection of 2½ feet supported by concrete brackets, making a walk or towpath 5 feet wide on the downstream side and a series of notches or weirs on the upstream side to relieve the canal of surplus water.

The trunk is 36 feet wide in the clear, with a depth of water in the channel of 5 feet. These side walls were built in short alternate sections and were connected by sheet-lead expansion joints. The lead sheet was about 20 inches wide and 6 feet long; it was folded lengthwise with a convolution in the centre of the sheet and holes were punched in the sheet for anchorage in the adjoining sections.

This expedient, Mr. Mabee states, has proved entirely successful. The aqueduct has been in service now for four years and no leaks have developed, although contractions of the sections have been noticed during cold weather.

The structure contains 4,500 cubic yards of concrete mixed 1 : 2 : 4, the cost per cubic yard being as follows: Cement, $1.90; steel, 77 cents; sand and gravel, 54 cents; lumber, 90 cents; form labor, $1.12; concrete labor, $1.29; total, $6.52.

Slow Sand Type of Filter.

The filters built in 1902 are of the slow sand type, covering 4.8 acres; they were originally built open and in three large units. It was found necessary to cover and divide them into six units, approximately 100 x 350 feet each. Cast iron columns were selected for the supports in preference to concrete piers, to save time in erection and to minimize the disturbance of the filter material and pure water drainage system, which had been completed and in operation since September, 1904. No provision had been made for covers in the original plans.

The covers consist of 3-inch slabs supported by concrete beams 19 feet 7 inches long spaced 6 feet 9 inches on centres; the beams are 8 inches wide and 15 inches deep; these are in turn carried by 18-inch I-beams encased in concrete and bolted to the columns, forming a continuous girder 22 inches deep, which is supported on cast iron columns 7 inches in diameter and spaced 20 feet 3 inches on centres. The columns rest on cast-iron base plates 15 inches square, laid on short piers. They are filled with concrete and are kept well painted with asphalt paint. The excavations for the columns were accomplished by means of cylindrical sections of steel plate which were easily driven down through the 4-foot of filtering material.

The partition walls are 14 to 17 feet high and 1 foot thick, reinforced in both faces vertically and longitudinally with ¾ and ½-inch bars respectively. The slab reinforcing consists of ¼-inch bars spaced 3 inches on centres in the direction of load and 6 inches on centres in the opposite direction.

The entire slab, covering 70,000 square feet in each double filter, is built monolithic, without any attempt to provide expansion joints.

About the four sides there is parapet wall for retaining a cinder filling, and for closing the spaces between the beams. This wall is kept separate from the main supporting wall by a parafine joint, the I-beams resting on rollers in the wall. The lubricated joint was provided to allow the cover to expand and contract freely without introducing bending into the main wall. These covers and walls are water-tight for all practical purposes.

The work was done with a cableway, spanning 450 feet, with movable towers, the concrete being handled from the mixer to the cableway by means of a shuttle car on a narrow gauge track, propelled by a stationary engine and cable. In this way 80 cubic yards was an average day's work, covering 5,000 square feet of surface. The concrete was mixed in proportions of 1 : 2 : 4. The cost of walls and covers are given in accompanying table.

Cost of Walls and Covers Exclusive of Superintendence

	Cost of Walls per cu. yd.	Cost of Covers per cu. yd.	Cost of Covers per sq. ft.
Reinforcing bars	$3.05	$4.45	$0.076
Labor placing bars	0.76	0.65	0.011
I-beams	....	....	0.063
Placing I-beams	....	....	0.003
Sand and gravel	0.75	0.75	0.013
Cement	1.61	1.85	0.031
Placing concrete	1.00	1.06	0.018
Lumber for forms	0.55	1.06	0.018
Labor on forms	2.98	3.52	0.060
Columns	....	....	0.031
Miscellaneous	1.36	1.31	0.020
	$12.06	$14.65	$0.344

The Pure Water Reservoir.

The pure water reservoir is built near Fall Creek on a gravel foundation at the ordinary ground water level. The groined arch bottom was designed to resist the upward thrust of extraordinary high ground water at such times that the reservoir is empty. The earth fill, 2 feet deep on the cover, and the weight of the structure itself would overbalance any upward pressure that might occur.

The lower section of the arch is reinforced with ½-inch twisted bars spaced 10 inches on centres in either direction, to bond the sections together and to prevent contraction cracks. No other waterproofing material was used, as under the low head of water carried the amount of percolation through the concrete itself would be inconsiderable if cracks could be prevented.

The walls were 1 foot thick, securely anchored to the floor and cover, and were reinforced against side thrust in both faces and against longitudinal temperature stresses. The wall was built monolithic about the four sides of the reservoir, the corners being rounded by curves. Nothing worse than a few fine hair cracks showed up and these did not occur at the corners as is usually the case.

The roof slab is 5 inches thick, reinforced with ⅜-inch rods with variable spacing; this slab is supported by concrete beams 8 inches wide and 16 inches deep, which are carried by plain concrete columns 12 inches square, spaced 10 feet on centres.

The cost of the pure water reservoir per 1,000 gallons of storage was $9.33, exclusive of superintendence and office expenses. The cost per square foot of water surfaces was as follows: Excavation (7-foot cut), $0.08¼; refill on cover (2 feet). $0.03; floor, $0.15¼; wall (distributed), $0.04½; cover, $0.24¼.

The greatest amount of concrete placed in one day of ten hours was 134 cubic yards, while the average amount for the concreting period was 70 cubic yards. The total quantity of concrete was 5,195 cubic yards; the total excavation, 26,000 cubic yards, and the total refill 10,000 cubic yards.

The reinforced concrete pipe line was built during the winter of 1907-08. It is 840 feet long and is used for the purpose of conveying raw water to the precipitation basins. It is laid 11 feet below the hydraulic gradient. The inside diameter is 66 inches, and the concrete shell is 6 inches thick. It is reinforced with ½-inch twisted bars spaced 8 inches on centre in either direction. The pipe was built in three general operations after the ditch had been dug to dimensions corresponding to the outer circumference of the pipe.

A concrete cradle 30 inches wide was first laid to grade holding the lower circumferential rods, the rods being held in position by curb boards notched out to receive them and also by the lower longitudinal rods. These lower circular rods were heated and bent in the field to the required shape, and they were left long enough to project into the upper ring about 12 inches. Semi-circular metal forms were then placed on this cradle and fastened down by timbers laid across the tops and staked into the side of the trench to prevent the forms from floating.

Concrete Mixing and Setting.

The concrete was mixed in the proportion of one of cement, two of sand and four of gravel, and was poured into the space between the side of the ditch and the metal form, this operation completing the lower half of the pipe; the metal forms were then inverted and supported on wooden roller bearings and wooden track. The upper rods were then fastened to the lower projecting rods and curved wooden forms were braced into position for moulding the upper ring, leaving a space 18 inches wide open along the top for placing the concrete.

To facilitate the setting, as this work was done during the cold weather, gasoline torches were burned inside the completed portion until the whole was completed, and the narrow exposed strip on top was protected by canvas. About 100 feet of completed work a day was the usual progress, the metal forms being moved ahead in 100-foot sections without disjointing. Mr. Mabee reports that no cracks of any kind were discernible at the completion of the work, and that the pipe is watertight.

The pipe contained altogether 300 cubic yards of concrete, and the total cost was $12.46 per cubic yard. The cost per lineal foot is given in the table. The concrete was mixed in a batch mixer and wheeled an average distance of 500 feet.

Cost Per Lineal Foot of 66-inch Pipe.

Placing centreing and forms	$0.958
Rental of metal centres	0.120
Steel reinforcing bars	1.054
Labor placing bars	0.258
Cement	0.674
Placing concrete	0.843
Hauling materials, including gravel	0.251
Engineering	0.054
Miscellaneous	0.098
	4.310

Bids received on 60-inch light steel pipe proposed for this purpose on board cars Indianapolis ran from $6.70 to $7 a foot. One bid contemplated furnishing and laying in the ditch prepared by the company for $8.25 per foot. Sixty-inch light-weight cast iron pipe would have cost $15.50 a foot, f.o.b. Indianapolis, to which must be added the cost of lead and laying to make the costs comparable.

The cost of the concrete pipe, Mr. Mabee points out, did not include excavation, which would have been the same in either case; nor the cost of the gravel, which would add about 27 cents a foot; so that the reinforced concrete pipe cost about one-half as much as steel and about one-fourth as much as cast iron; in addition it was 6 inches greater in diameter than either, besides having the advantage over steel of greater durability.

The Recording Apparatus.

With the installation of the preliminary treating plant, it became necessary to know how much raw water was being treated with chemical, and at the same time have the apparatus for recording and indicating these amounts convenient to the operating headquarters. Accordingly a reinforced concrete Venturi meter 42 inches in diameter, having a throat diameter of 21 inches, was built in the 42-inch raw-water conduit and the indicating apparatus was placed in the laboratory building. The throat section was of cast iron and brass. The conical forms were made up by the planing mill and worked on perfect lines and dimensions. The concrete was mixed in the proportions of one of cement, one and one-half of sand and three of gravel. The meter was built in the fall of 1908 and has been in service now for several months and is, Mr. Mabee reports, in every respect satisfactory.

The coagulation basin is part of the general scheme for clarifying the raw river water by coagulation. The baffle walls are 70 feet apart and are reinforced simply to prevent contraction cracks. The embankments are of earth, sloping two on one, and are lined with a 4-inch slab of concrete, reinforced by ⅝-inch twisted rods spaced 4 feet apart in either direction. The slab floor is 4 inches in thickness and was laid in alternate blocks 8 feet square. The floors slope 1 in 35 to the open ditches, which in turn slope 0.2 to the 100.

Water pressure pipes with hose connections are built into the baffle walls to facilitate the flushing out of sludge during cleaning periods. This portion of the precipitation basin was built during 1908 and went into service last November.

In connection with the coagulating basins and for the purpose of treating the raw water at seasons of excessive turbidity, there was built a chemical treating house. The lower part of the building contains principally lime saturating tanks, over which are built the iron solution tanks. The columns, floors, walls, stairways, roof and tanks are of reinforced concrete throughout. The building is veneered with pressed brick and stone trimmings.

In connection with the iron solution tanks, it was observed that any tendency for water to percolate through the concrete was promptly checked as soon as the sulphate of iron solution was introduced. All tanks were built monolithic as boxes, in one operation and independent of each other.

A record for concrete mixing is reported from the Sacramento Hotel, recently built at Sacramento, Cal., where 381 cubic yards of concrete were made and placed in 8¾ hours. This involved the mixing of 315 cubic yards of rock, 158 cubic yards of sand, 572 barrels of cement and 460 barrels of water, and the hauling of the mix a maximum of 225 feet and an average of 150 feet. The plant consisted of a No. 2 Ransome mixer, driven, by shaft connection, by a 30-h.p., a.c. Westinghouse motor. Crushed rock and gravel were brought to the site by teams, dumped into large bins from which they were fed by belt conveyor to a charging hopper above the mixer. After mixing, the concrete was dumped into a mechanical hoist and conveyed to its place on each floor by ten men, each with a concrete cart.

D. Lorne McGibbon, managing director of the Canadian Rubber Company, Montreal, presented $10,000 to the Y.M.C.A. building fund in that city. It is also announced that Mr. McGibbon is helping to defray the cost, somewhere around $100,000, of a splendidly equipped sanitorium for the treatment of consumptives. The building is to be erected in the vicinity of Ste. Agathe, Que.

Useful Knots, Loops and Hitches for Builders

The question of tying a rope to timber, logs, or other heavy building materials is often a matter of considerable importance to the builder and contractor, and for those who may have to erect scaffolds, splice ladders, or hoist materials by derrick, winch, or crane, from one place to another, and to assist these parties and convey such information as may enable them to tie properly, and with safety, such knots or hitches as may be necessary, this paper has been prepared.

Most of the illustrations and descriptions given herewith, are taken from a small work, by "Tom Bowling," an old "man-o'-war's-man," who was thoroughly up to his business, and they may therefore be relied upon as being correct and suitable for the purposes intended.

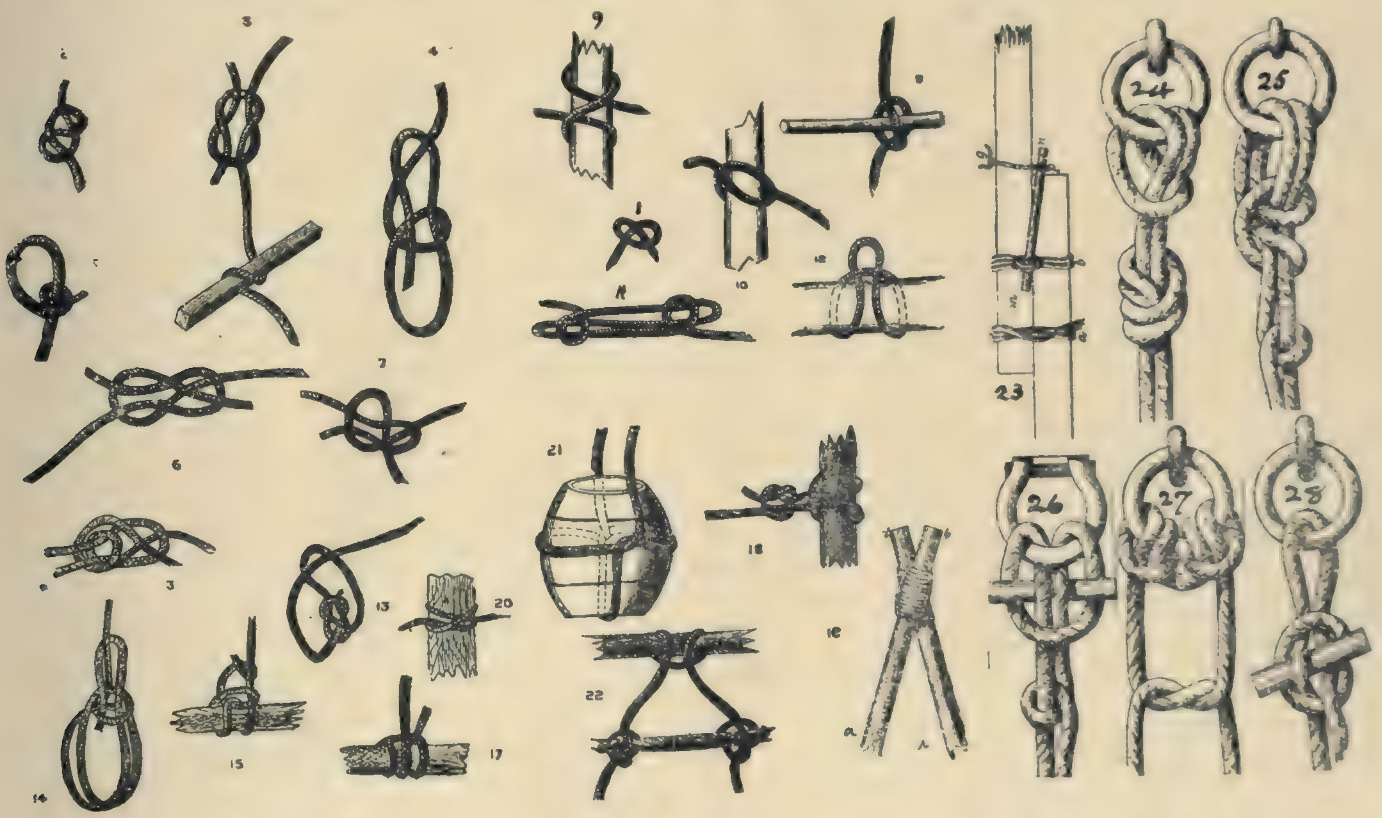


Fig. 1 in the illustration is a thumb or overhand knot, and its use is to tie at the end of a rope to prevent it opening out, or same purpose as No. 2. Fig. 2 is called figure-of-eight knot, and used to prevent the running end of a fall passing through the sheaves of a block. Fig. 3—Woolding, or packing stick hitch. Ropes may be hauled taut by means of a woolder, or stick, as Fig. 8. Fig. 4—Bowline knot, which will not run up or tighten. Fig. 5—Inside clinch, for fastening the cable to ring of anchor; also the standing end of the gin fall to the lower block. Fig. 6—Common or sheet bend, sometimes called "single bend," also weaver's knot; is used for joining two ropes, or securing a rope through an eye-splice. Fig. 7—The same as fig. 6, but hauled as nearly taut. Fig. 8—Woolding stick hitch, as fig. 3. Fig. 9—Clove hitch, for making fast the bight of a rope to any object. Fig. 10—Half hitch is made by passing the running end of a rope round the standing part, and bringing it up through the bight or loop part. Fig. 11—Sheep-shank or dog-shank, for shortening a long rope without cutting it, and without injury to the rope. Fig. 12—Bale sling, forms a loop to pass over hook of lifting tackle. Fig. 13—Double bend. An addition is made to the single bend, when a small rope is bent on to a larger by passing the end a second time round the bight of the rope. Fig. 14—Double butt or barrel sling, placed horizontally. Fig. 15—Fisherman's bend, for spar or scaffold poles. Fig. 17—Magnus hitch for timber. Fig. 18—Lark's head, fastening to a running knot. Fig. 19—Portuguese knot, made by several turns of a small rope round two shear legs, hauled taut and interlaced at the ends, d b and aa show the shear legs and c the coil. Fig 20—Builder's knot, used by workmen in securing building materials. When tied cannot come undone on account of great friction between the parts. Fig. 21—Butt or barrel sling when lifted endwise. Fig. 22—Drag rope or lever hitch. Fig. 23 is a packing knot and is used for binding timber together; a shows the knot commenced. Take several turns of rope round the timbers, and fasten the ends by passing them under the turns; b, knot completed. Pass the end of a round stick, m, n, termed a "packing stick," under the knot, the rope having been left a little slack to allow of this. Then by turning the stick, m, n, all the turns are made tighter. Fig. 24 shows a "lark's head knot." At Fig. 25 is a similar knot used for the same purpose. Fig. 26 shows a "lark's head knot" on the ring of a boat. This is a good useful knot, and has the advantage of being released instantly by withdrawing the pin which constitutes the "lark knot." The knot shown at Fig. 27 is a simple boat knot with one turn.—National Builder.

A painter says that if before painting a smoky wall or a greasy wooden surface, some limewash is applied, the paint will take on the object to be covered.

CANADIAN PLUMBER HEATING AND LIGHTING ENGINEER

[NOTE.—Contributions suitable for publication in this Department are invited from subscribers and readers.

Principles Upon Which Plumbing Systems Should Be Founded

The leading principles which form the foundations upon which all plumbing systems should be based are outlined in a paper recently contributed to the Quarterly Bulletin of the Vermont State Board of Health by William Gerhard, C.E., the well known New York City expert, whose remarks are, in part, as follows:

Plumbing work comprises means and appliances for supplying buildings with water, for removing water fouled by use, and for removing storm-water from roofs and paved courts and areas. I shall here consider only the removal of the water which has been used in buildings. This removal is accomplished by a system of fixtures, traps, waste, soil and drain-pipes, with the necessary vent-pipes; these together constitute the house--drainage system.

The individual house-drainage systems form the units composing together the joint sewer system of a community. To be effective, the house-drainage system must be correctly laid out and operated properly. Every such system should fulfil certain requirements, which I will state briefly

1. The house-drainage system should remove from the building quickly and completely all liquid wastes, including human excreta, water used for washing and bathing purposes, kitchen water, and sometimes, though not always, the storm-water. The removal of the house sewage should be effected before decomposition sets in. It should be accomplished without contaminating the soil, the air, or the water.

2. A house-plumbing system should be so arranged that under no circumstances will there be an escape of sewer-air into any room in the building. This is accomplished by the proper and safe trapping of all outlets.

3. Foul gases, originating in the house-pipes, should be diluted, oxidized, and thus rendered inocuous. The entire pipe-system should be without long dead ends, where the air would stagnate.

These are the three general requirements which every system must fulfil.

I come now to some more specific advice, contained in the following maxims:

1. Each building should have a separate connection with the street sewer. Large buildings may require several connections, and these are better than one pipe of a very large size.

2. All the drain, soil, waste, and vent-pipes within the building, and up to a point five feet outside, should be of heavy cast-iron pipe, with lead-caulked joints, or of galvanized screw-jointed pipe with recessed drainage fittings. No earthenware or tile-drains should be allowed within the building.

3. All pipe-conduits for sewage should be constructed air and water-tight, to prevent leakage of sewage and of sewer air.

4. All the horizontal and vertical pipes should be carried as straight as possible. Offsets on vertical vent-lines should be made under 45 degrees.

5. On horizontal lines use Y branches, not tees, for junctions or connections.

6. All the pipe-conduits, traps, cleanouts, as well as the fixtures, should be kept exposed and easily accessible for inspection or repairs.

7. All the pipe-conduits should be of minimum diameter consistent with volume of sewage or waste water to be carried, because in this way the flow of water is more concentrated, and the pipes are flushed out better.

8. All pipe-conduits should have good supports, good alignment, and a sufficient fall.

9. All soil and vent-pipes should be extended the full size to the roof, or even enlarged at the roof, to prevent closing of the pipes by hoar-frost in cold climates. No pipe above the roof should be less than 4 inches.

10. The number of vertical stacks in a building should be reduced to a minimum, and this can be accomplished by concentrating the plumbing work and making branches as short as possible.

11. Reduce the number of fixtures and arrange them as much as possible, and as much as is consistent with convenient use, in vertical groups. A single soil-pipe may answer for the fixtures on the number of floors.

12. Place plumbing fixtures only in ventilated rooms, and confine the plumbing to bath and toilet-rooms, to kitchen, pantry and laundry.

There is a question which has been brought up from time to time, and that is whether it is feasible and safe to have stationary wash-basins in the sleeping rooms. In general I do not advise it. I think the rules laid down by boards of health should not permit it, because there is always a chance of some joints opening up and letting sewer air enter the apartment. Personally, I should not hesitate to have such a basin in my sleeping room; but I should give the plumbing very frequent inspection and tests. With regard to the location of the bath-tub and the water-closet, I would say it is a general custom to put these in the same room, whereas in English houses and in many of those in Continental cities the water-closet is placed in a separate apartment. For a great many years I have spoken and written against this practice, which I consider inconvenient, particularly for the smaller houses. In these it is, in my judgment, very much preferable that the closet and the bath-tub be in separate compartments.

13. All the plumbing fixtures should be trapped separately and safely. The trapped waste from one fixture should never pass through another trap before reaching the soil-pipe or the house-drain.

14. Fixtures should be of non-absorbent material; all sharp corners should be avoided, glazed and smooth surfaces are required. Wood and porous stone should be condemned as unsuitable.

15. Modern plumbing work dispenses entirely, and properly so, with the former wooden enclosures of fixtures.

16. There are certain pipes in every house which

should never be connected to a sewer or soil-pipe—for instance, the overflow pipe from the house tank, and in particular the wastes from refrigerators or ice-boxes. These should drip over a trapped and water-supplied sink.

17. Avoid having in the house any fixture which is not in daily use, as the evaporation of water will soon unseal the trap.

Each plumbing fixture should be arranged to empty quickly, like a flush tank. All pipe-conduits should be well flushed, and if the grade is slight, special flushing appliances for the house-drain should be provided.

These are the leading axioms, which I shall require you to keep well in your mind. Note also the following summary of requirements:—(1) Good and durable material; (2) good workmanship; (3) good supports, fall and alignment; (4) proper junctions; (5) direct and short runs; (6) accessibility of all parts; (7) safe trapping of the fixtures; (8) perfect ventilation; (9) powerful flushing; (10) instant removal of all wastes from the building; (11) noiselessness in action; (12) protection against freezing of the plumbing; (13) prevention of unnecessary waste of water; (14) simplicity of arrangement, concentration of work; (15) avoidance of all complicated mechanical apparatus.

These rules should be applied, where the plumbing is in charge of a health officer, to all new work for which plans are submitted to him. They also should be made to apply to inspections of old plumbing work.

Let me mention here one popular fallacy—viz., that "only nickel-plated plumbing work" can be sanitary. I want to assure you that you can have just as sanitary plumbing work if you use iron or lead piping, which can be made to look well by aluminium bronzing or enamel painting.

Warm Air Furnace Heating

The great advantage of a warm air furnace heating system is that it supplies fresh warm air, and this single feature, from a hygienic standpoint, places the warm air furnace in a position far superior to that of any other form or system for warming dwellings. Moreover, the expense for installation, operation and subsequent care of the warm air furnace system is less than that of any other.

The warm air furnace, to be effective, however, must be large enough. It is, in fact, a matter of economy to use a furnace one size larger than is actually required, and it must be borne in mind, too, that the relation of the air supply, the size of the piping and the size of the registers to the furnace and to the rooms to be warmed are very important factors in the success of a warm air furnace heating system.

The success of the system depends also upon the careful installation of the furnace, the piping and the registers.

Every warm air furnace heating system is a problem in itself. The rules entering into the science of heating cannot be ignored, nor can success be attained unless these rules be considered and applied to the problem with judgment. Even after the exercise of care and thoughtful attention, it sometimes occurs that a certain run of warm air pipe or, perhaps, the entire system, fails to realize the expectation of the owner and the heating contractor, and when this occurs it should be borne in mind that "every effect must have a cause." Search for the cause, remove it, and the system will be successful. Minimize the chance of failure when planning a warm air furnace heating system by observing these facts: (a) That warm air, following the law of nature, flows upward, and as the natural movement of the warm air is upward, it follows that the greater the elevation of the warm air pipes the more rapid will be the flow of air.

(b) That warm air flows toward the point of least resistance, and the velocity of the air movement in a warm air pipe depends upon the excess of temperature of air in the pipe; depends upon the height of the outlet above the furnace; depends upon the absence of frictional resistance in the pipe and depends also upon the absence of pressure resistance in the rooms to be warmed.

Warm air furnace heating, to be successful, should be considered in connection with ventilation. Circulation of the air is, in the absence of scientific ventilation, an acceptable substitute. Its adoption, in the absence of ventilation, provides a means for displacing the air of lower temperature from the rooms.

Success or failure of a warm air furnace heating system, finally, depends upon the smoke pipe and the chimney. If the smoke pipe is not the proper size and the chimney does not have sufficient capacity and is not properly constructed, it is useless to expect the successful and satisfactory operation of the furnace.

The first important factor in furnace installation is the determination by accurate rules of the space to be warmed. Then to determine by positive rules the size of the furnace required. These to be followed by a proper consideration of the piping, the risers, the registers, the smoke pipe and the chimney.

Manufacturers, with but one exception, so far as I know, have referred to furnace capacity as equal to 20,000 to 30,000 cubic feet, and, although this is a custom of long standing, it is incorrect and frequently leads to the installation of a warm air furnace entirely too small for the work required of it. It is much the better plan to base the capacity of a furnace on some system that will consider both the wall and glass exposure, as well as the actual cubic feet in the rooms or dwelling. These three eements, the actual cubic feet, the next wall exposure, and the glass exposure, might be termed gross cubic feet.

The capacity of a warm air furnace on the gross cubic feet plan can be determined by taking into consideration the average diameter of the fire-pot, by a formula that considers, too, the consumption of a certain amount of fuel per square foot of grate surface per hour.

The size of piping and registers required to warm a certain gross cubic feet may also be determined by fixed and positive rules.

The limit of warm air piping that a furnace will carry with success and without the danger of overloading the furnace can be determined, also the amount of air to be introduced to the base of the furnace, may be ascertained by a rule that will give sufficient air to fill all the pipes. If this is not done (namely, the admission of sufficient air to fill all the pipes), the success of the system is endangered.

Baltimore is a city which has a water supply problem to work out. The appropriation for the purpose is $5,000,000, and the source from which the water is to be brought is the Gunpowder river, in the valley of which a great reservoir is to be built. It is expected to be completed in about five years. The land desired, with the adjacent watershed, will cost from $1,000,000 to $1,250,000, and half a dozen villages—the largest of which has a population of 900—will be obliterated and a number of mills torn down. The reservoir will cover a large tract of former farms.

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A Wrinkle for Furnace Men

A simple rule for determining the equivalent cubic feet is: To the cubic feet in each room add for wall and glass exposure as follows (one-tenth of each square foot of wall exposure being equal in cooling effect to 75 cubic feet, and one square foot of glass exposure being equal in cooling effect to 75 cubic feet):

First, obtain the cubic feet by multiplying the length by the width of the room and by multiplying this result by the clear height of the ceiling.

Then multiply 10 per cent. of the net wall exposure by 75 and add this amount to the total.

Then multiply the glass exposure by 75 and add this amount to the total cubic feet, and the cubic feet, the multiplied 10 per cent. of the net wall exposure, and the multiplied glass exposure will constitute what may be called equivalent cubic feet; that is to say, the total will be equal to the cubic feet to be considered in determining the size of the furnace, the size of the warm air pipes and the size of the registers that will be required to heat the house.

A Cement to Resist Sea Water

A cement for resisting sea water was described in a recent issue of the "Journal" of the Society of Chemical Industry by Mr. C. J. Potter. It is made by grinding six parts by weight of calcined red brick clay with ten parts of Portland cement clinker, and is known as "red cement." Tests of briquettes immersed in fresh and sea water for periods up to ten years show, Mr. Potter states, that while Portland cement decreases in strength in sea water, red cement, on the other hand, increases in strength. Both red and Portland cement increase in strength in fresh water, the latter in the larger ratio. Over 5,000 tons of red cement have already been used in sea and fresh water, and the results are said by Mr. Potter to be satisfactory.

The World's Largest Concrete Bridge

The bridge over the Wissahickon Creek in Philadelphia, said to be the largest reinforced concrete bridge in the world, is an illustration of the great size now possible for such structures. It is 525 feet long and 147 feet in height, with a main arch 233 feet long and approach spans measuring 53 feet each. Over 300 men were continuously employed for more than two years in building it, using for this purpose fore than 19,000 cubic yards of concrete, weighing 40,000 tons. Before the concrete work was begun a false-work bridge was constructed with 360,000 feet of timber and 130 tons of steel. The total cost of the bridge was $260,000.

The growing use of concrete is indicated by its recent adoption in various parts of the United States in building lamp posts. The officials of the District of Columbia are experimenting with several and those designed in concrete which have been erected in Washington, have been made the subject of much favorable comment.

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